Vol. 16, No. 2 February 1997

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Monitoring Times™

Vol. 16, No. 2 February 1997

Cover Story

An Ear to Indonesia

By Arthur Cushen

Radio has been crucial in hammering a nation out of the scattered islands of Indonesia. Most of Indonesia is either water or mountains: thus the importance of radio. Our cover photo (taken by Fred Moore; graphic treatment by John Bailey) depicts a typical, remote, mountainside farm.

Arthur Cushen has been listening to Indonesia over its 60 year broadcasting history. This is his account of monitoring both shortwave and mediumwave stations from his location in New Zealand. For monitors in North America, however, Indonesia poses a difficult challenge, only surmountable during the winter months. It's not too late: why not try your luck with some frequencies that have already been logged this winter?

CONTENTS

Reviews:

Weighing in with typical German excellence is the new Becker car radio model, the Mexico 2340. See Magne's review of this shortwave radio that can turn your domestic travel into a global adventure (p. 92).

"We tested a PRO-2036 and its BC890XLT twin in June '95 and found their performance disappointing. It is with relief that we report this month on an improved replacement—the new PRO-2045." So begins Bob Parnass' review of the new scanner from Radio Shack on page 94.

If you've been curious about surfing the net via your TV screen, here's a look at one of the first available units—Magnavox's Web TV. John Catalano has been using it for the past few months and shares his assessment of this latest technology on page 88.

DEPARTMENTS

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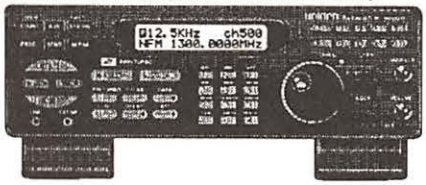
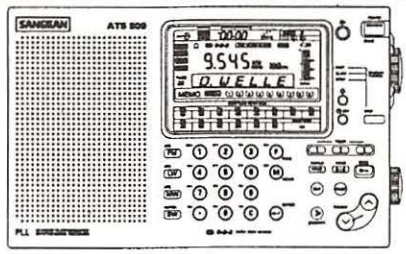


Shortwave Radio



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LETTERS

Operating in CUT Time?

In December, Bob Grove threw out the challenge to his readers to explain why Universal Coordinated Time is abbreviated UTC and not UTC or CUT. He received several replies. Ozzie (Robert Osband) N4SCY provided the official explanation from the web site of the National Institute for Science & Technology, "the people who bring you WWV." You can look up their answer at **<http://www.boulder.nist.gov/timefreq/faq/faq.htm >**

Steve Green, of Santee, California, gave us the same information from a more personal point of view: "I started the radio hobby about 1970. It was sometime in the period from 1970-1972 that the ITU met to revamp international time standards.

"One of the decisions of the ITU when the UT1 time standard was set, was to come up with an abbreviation that did not have any bias toward any nationality. So they chose the abbreviation UTC because NO language would abbreviate Coordinated Universal Time that way. Hence, no perceived bias.

"So science gave way to political correctness, and it wasn't even the eighties yet! On January 1, 1973, at 00:00 UTC, WWV made the switch to UT1 (from UT2) and UTC became the politically correct terminology for Greenwich Mean Time.

"And I was listening—on 10 MHz."

Ham Radio: Point, Counter-Point

• The majority of Bob Grove's October "Closing Comments" addressed his assessment of the strengths, weaknesses, and direction of the radio hobby market. However, most reader responses were elicited by one paragraph in which Bob spoke about the "moribund state" of amateur radio, citing some of the contributing factors. One ham, Kent Price KF2AD, canceled his three-year subscription to *MT*, and suggested Bob give up his amateur standing for which he didn't seem to have any respect.

Bob's response to the latter is that, "Former reader Price's letter supports my case; while he asserts his viewpoints, he refuses to consider mine. Rather than deal with the problems ham radio faces as briefly mentioned in my Closing Comments, he irrationally cancels his remaining three years' subscription to *MT*.

"Voluntarily turn in my license because he doesn't agree with my comments? I don't think so. I believe that everyone has a right, even a duty, to express his opinion on issues. I only wish Price felt the same way."

• Making the more eloquent case for ham radio was Bill Mayers, KG2DI—"RT, RN, member ARES, SATERN, IMRA, Official Emergency Station, Vice-president Madison/Oneida Amateur Radio Club, proud father of three hams, and husband of another..."

"I regret that you denounced amateur radio so succinctly in your column. In your unique position as a publisher, your words carry an impact far and wide. Because of this, you're in a position to do much that is good, or much that is bad, for the electronics communications industry as well as communications professionals and hobbyists. I fear that your remarks may be taken up by interests that would stand to profit handsomely were amateur radio frequency allocations to be auctioned off to the highest bidder.

"Noting that you are a ham, and apparently have been one for some time, I will not bore you with rousing tales of amateur radio 'coming through' in times of disaster. I will not attempt to elicit your tears through tales of families blessed by hearing their child's voice from a faraway military post via the MARS circuits. I won't repeat for you the multitude of innovations and advances in the electronics and communications arts that have come to us through the efforts of such hams as Grote Reber, or how ham radio has enhanced the lives of even noted public figures such as a certain retired senator from Arizona or a certain sightless country-western star, name of Ronnie Milsap. I won't, because as a ham, you know all this.

"I will ask you, in light of the above, what has happened to elicit such negative commentary from you? You remark upon the content of amateur communications. Well, yes, we have some real bozos in our ranks. I've come across jerks on 75-meter phone bragging about their marital infidelity. I've encountered a cretin (whose call indicated he's been an Extra-class ham for some time) who wantonly disrupted communications of others for over an hour because he'd decided one of the others whose communications he was disrupting was a black man. Is that it, Mr. Grove? These folks exist in all walks of life, but we do not denigrate an entire hobby or profession because a few of them are meatheads.

"I've also listened in complete boredom to a couple obviously older geezers who blathered on and on about their favorite brand of coffee. I've heard others go on and on about the relative worth of each other's favorite household pet, and still others waste spectrum going on about whose state has the prettiest sunsets. Is that it, Mr. Grove? Good heavens, sir, it's a *hobby*.

"I'm also a volunteer examiner. My VE group holds exams monthly, and we've no shortage of people coming to us, eagerly plunking down the required IDs and paperwork, and then sweating—and yes, I mean SWEATING—some not-so-easy written exams as well as even harder code tests. If ours is a dying hobby, Mr. Grove, you couldn't prove it by me.

"Sure, it's changing. It has to, or it will indeed die. The Internet and e-mail, and to an extent, Internet Phone, have made their impact upon communications. However, rather than decline, all forms of communication—ham radio included—have garnered more adherents, not fewer.

"I won't ask for an apology; you did nothing wrong. But I will ask you to reconsider your negative comments in your magazine. Ham radio has given many of us great joy and also brought succor to many others in times of distress. It is unreasonable, in my humble opinion, to assert that this great hobby is doomed, either by loss of interest or due to the impact of competing technology."

• To which Bob Grove replied, "Thank you for your excellent commentary. I am pleased that my observations elicited defense from credible, articulate members of the amateur fraternity of which I have been an active member for 45 years. I agree with all of your postural comments, just as you agree with mine. I'm sorry that you took this singular set of three negative comments out of the context of strong support for ham radio I have provided in the pages of *Monitoring Times* for its 15 years of publication.

"In any case, ham radio is not dying, but it is stagnant. Our numbers of new licensees are not sufficiently balancing the numbers of deaths, non-renewals, and disenchanted abandonments.

"The presence of offensive transmissions on 20, 40, and 75 meters is vastly greater and more vehement than in the days of W2OY's CQs ("No kids, no lids"). Vulgarity, bigotry, and rudeness are endemic.

"But I still have my rig, my call, and my pride. I am happy to insert the comment, 'I'm a ham' into any conversation that invites it. I taught school for 16 years, and am responsible for countless numbers of students getting their ham tickets, many of whom are now in the technical professions as a result of that early exposure to my ham radio classes.

"Several of my coworkers at Grove Enterprises are now licensed because I took the time to conduct ham radio theory classes during the work day, giving them time off to study, and coaching them to be prepared for the exam. Far from denigrating ham radio, I am one of its biggest allies. But I believe in pointing out tarnish so it can be polished."

• ***Letters*** are edited for brevity and clarity by Rachel Baughn, KE4OPD. Send your comments to P.O. Box 98, Brasstown, NC 28902 or *mteditor@grove.net*.

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"...I don't know of any scanner , where I succeeded instantly in successful reception without studying the handbook..." Radio Scanner, August 1996

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"...high quality workmanship, good reception and easy usage." Chip, November 1996

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"WiNRADiO has enticing possibilities...The manual is an exciting book not only because of its beautiful cover, high quality paper, and easy instructions, but also because it contains a mix of operating and technical information about various aspects of radio you might have forgotten or never knew." World Scanner Report, Volume 6, No. 7

Frequently Asked Questions

What are the advantages of having a PC-based receiver compared to a stand-alone one?

1. Communications receivers are similar to test instruments - the trend is towards PC-based instrumentation which allows many front-panel functions to be more flexible and informative compared to a traditional, dedicated control panel.

2. The PC-based software controls all the ancillary functions such as scanning parameters, memories, logging and various operation modes. Compared to hardware or ROM-based firmware control, this gives the receiver greater flexibility, a greater number and sophistication of ancillary functions, practically unlimited memory capacity, and the ability to customize the receiver for special applications.

3. Without the constraints of a fixed control panel, a receiver can have different "personalities" depending on the user's applications and preferences. New functions, for example frequency databases, can be easily added and integrated with the receiver.

4. A number of independent WiNRADiO receivers can be controlled by a single PC. This is very useful if you need to monitor a large range of frequencies on a continuous basis, or where various methods of multi-channel transmissions are employed.

5. A PC-based receiver allows the user to take advantage of the digital signal processing capabilities of the PC. Modern PCs are fast enough to do such signal processing, decoding and display in real time, as well as provide mass storage for received signals.

How can a PC-based receiver cope with PC-generated electromagnetic interference?

WiNRADiO is very well shielded. We use specially developed shielding materials, and innovative design methods to prevent any interference directly entering the receiver. After all, every modern scanning receiver is controlled by an in-built microcomputer; we have simply reversed the roles, and put a shielded receiver inside the computer.

Specifications

- Frequency range: 0.5 to 1300 MHz *(excluding cellular bands)*
- Modes: AM, FM-N, FM-W, SSB
- Sensitivity: 1uV nominal (typ. 0.25uV on FM-N)
- Step size: 500Hz-1MHz (SSB, CW: 5Hz BFO)
- Scanning speed: 50 channels/sec (FM)
- Operating system: Windows 3.1 or 95 (NT available soon)

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Dealer enquiries invited.
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News

- Scanning speed now improved to 50 channels/sec (FM)
- New software allows simultaneous operation of up to 8 receivers
- See us at http://www.winradio.net.au

Lost? Please Pay Here.

It's part of the search and rescue business. A person who is in trouble will wait until the last possible second before calling for help. In part, that's because no one wants to admit they've messed up and gotten lost in the woods and in part because of a long-standing myth that the rescued must pay for the rescue. Both assumptions are wrong.

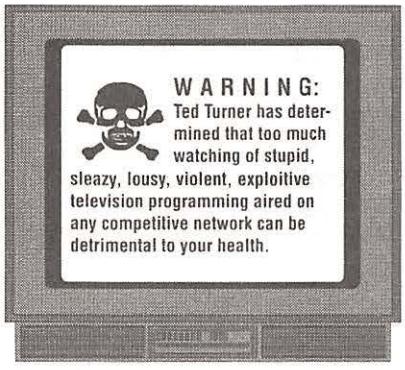
Now comes an advertisement from Motorola which reads, "Think a pair of two-way radios is expensive? Priced a decent search and rescue lately?" A caption under a picture of someone rappelling from a helicopter continues: "The UH-1 Huey military helicopter and a ground search team including ATVs, bloodhounds, night search lights—this rescue stuff can add up quicker than a Connecticut wedding."

According to the Colorado Search and Rescue Board (CSRB), the ad "will probably do more damage than any statement made about this mess in 15 years." Those who become lost in Colorado aren't charged for searches and the board wants the ad pulled.

The myth of the high-priced rescue has caused trouble in the past. CSRB cites a 4-year old case in which a wife waited three hours to tell authorities that her husband was missing on Mount Evans. She finally called after deciding that the money would just have to come from her bank account.

Kelly Zehfuss, director for marketing for Motorola, said that she doesn't know if the ad will be pulled. The ad, she said, was extensively tested with potential consumers and no one said it implied they would have to pay for the rescue.

Ted Talks TV



Ted Turner, Time Warner's new vice chairman, has told the public that if they don't like what they see on TV, they should turn it off. "People are beginning to realize the total effect of watching so much stupid, sleazy, lousy, violent, exploitive [television]. The way we use television, it's like alcohol. One or two drinks before dinner won't hurt you. But if you drink a fifth a day, it will kill you," said Turner helpfully.

The problem, of course, is not with the second generation TV station owner himself. It's competitor Rupert Murdoch. "He is exactly the kind of person I'm talking about who puts profits and power absolutely first, second, and third," Turner said.

Free Cordless Publicity

Hartford, Connecticut, police are attempting to find out who taped a cordless phone call between Assistant Fire Chief Billy Smith and a city firefighter, and then sent transcripts of the conversation to city hall. According to *The Hartford Courant*, the conversation included racial slurs, criticisms of some top fire and police administrators, and talk about firefighter's transfers and promotions.

Nonetheless, the tapes have created a firestorm of controversy. Smith, who is black, was removed as commander of operations because of the tapes and reassigned to desk duties. Smith's attorney, however, says that because the taping of the cordless phone calls was illegal and because the firefighter was off duty, "If there is any suggestion at all of discipline, we're not going to stand for it."

If Hartford police ever do find out who intercepted and taped the phone calls, says Mayor Michael P. Peters, the scanner listener "should be arrested for being an idiot."

According to one Connecticut *MT* reader, one effect of the story has been that sales of scanners in the city have "taken off" since their ability to monitor cordless phones has come to light.

Chicago Scrubs Morse System

The Chicago Fire Department is ripping out its telegraph system. Few people realize that the system uses Morse code to connect dispatchers with the city's 100 fire houses. It has operated that way for more than a century. The city is moving to a $217 million computerized dispatching system.

Still, old code pounders at the fire department—while admitting that the telegraph system is a goner—mourn its loss. "They are abandoning a tried and true system," complains Ron Heckla, a Chicago Fire Department alarm supervisor. "At its height, the old telegraph system dispatched over 1,300 alarms per day."

Doubters still cling to hope, however. Ken Little, a retired fire dispatcher, remembers when the city tried to dismantle the Morse telegraph system in the early 1980s and replace it with a high tech radio system. The high tech radio system, he says, proved to be so rife with glitches that city officials had to return to the telegraph again. The city seems less than wholly convinced, too. It says it plans to keep all the old equipment in storage.

By the way, when the *Wall Street Journal* covered this story, they titled it, "Chicago Firefighters Will Stop Dashing; Some Say Dot's too Bad."

Talk Radio Cairo

Conservative, Islamic Egypt has its own version of Howard Stern. Sort of.

Buthayna Kamal sits in the studio of a Cairo's radio station, dragging on a cigarette, and opens the microphone. "Confessions, nocturnal confessions," she intones over spacey music. "The world is ugly and beautiful and, you know, this is what makes it good." Her callers begin to pour out their hearts on the air. Stories of amorous suitors, rape, infidelity, incest, premarital sex, and frustrated love fill the airwaves. Kamal, who does not claim to be a therapist, says that she gives sympathy. "I am a sister and a friend."

However tame her advice, the topics discussed on the show strike deep into deeply conservative Egyptian culture where the subject matter of the show makes just about everyone squirm.

Public reaction to the show has been mixed. While it is possible to hear the show blaring from taxi cabs cruising Cairo's back streets at 1 a.m., reviews in the local newspaper are not so kind: "I want to vomit as I listened..." said one writer.

Internet Sting Operation

The *Indianapolis Star* is reporting that sheriff's deputies in two states worked together over the internet to nab a man who was selling stolen two-way radios.

The tale began in Indianapolis when a reserve Rocky Ripple marshal walked into the Metropolitan Emergency Communica-

tions Agency (MECA) and asked them to program three high-tech radios so they could be used on the county wide emergency broadcast network. When MECA director Linn Piper noticed that the radios were set to operate on a Florida Fire Department's frequency, he checked the records and found the radios had been stolen from a Pompano Beach, Florida, fire station.

"How did you get these radios?" Piper asked the marshall.

It turns out that he ordered the radios over the internet; all three for $1,700. The radios were returned to Florida where lawmen there decided to set up a sting.

Police in Marion County sent a message to the salesman who called himself Captain H.C.. He said that he still had a couple of these radios left. "Where are you located? We'd like to meet you and pick these radios up in person," the police said. Captain H.C. agreed.

When the two met, the police were wearing body wires and Captain H.C. was talkative, saying that he could get more radios but that he had just sent three to Indiana. In fact, Captain H.C. said, the guy in Indiana had not paid him and he had reported the incident to police as a theft.

Knowing that he was the guy who sent the stolen radios to Indiana, the police arrested Captain H.C., a.k.a. Joseph Penny, an 18 year old. Penny said that he sold the radios to pay off his credit card debt. Police found 15 other high-tech walkie talkies in his car and home. His case is pending.

Pompano Beach officials say that each radio is worth $3,000. Twenty-nine of them were stolen from area fire departments in the last year.

Phone Violence

Wireless Week says that not all cell phones are weapons in the war against crime. According to reporter Monica Alleven, they sometimes are used *as* weapons. She cites the following cases:

In Pittsburgh, a police officer testified that he almost shot a motorist when he waved a flip phone at him. The officer thought the phone was a gun.

In Los Angeles, a detention center guard is going to trial after smuggling a cell phone into former Rams defensive back Darryl Henley's cell. Henley is accused of using the phone to discuss a murder.

An employee of boxer Riddick Rowe was videotaped using a cell phone to attack a boxer at New York's Madison Square Garden.

The Cellular Telecommunications Industry Association says it certainly doesn't condone the use of phones as weapons. Says CTIA spokesman Tim Ayers, "We don't have any statistics, but I'm sure it happens occasionally, just like beer bottles or a stick. It's just handy."

EVOLUTION OF WEAPONRY

Remember, folks. When cell phones are outlawed, only outlaws will have cell phones. Or something like that.

AEA Being Sold

If you called the phone number of Advanced Electronic Applications' (AEA) last fall, you heard a recording informing you that the ham radio company was being sold and to check with the ARRL in about a month for news on its disposition. Interestingly, the Amateur Radio Relay League said it never agreed to be a contact point.

The ARRL does, however, shed some light on the current situation in *The ARRL Online Letter*. Apparently Advanced Electronic Applications Inc is being broken up and sold. AEA Chairman Mike Lamb, N7ML—after laying off most of the staff at the company's Lynnwood, Washington, headquarters in the fall of '96—announced in December that each of its three product lines (data products, test analyzers, and antennas) is being sold to three separate buyers. Although he said letters of intent are in place, the sale is not expected to be final until after the holidays, in January.

Lamb declined to name the new owners, but said an official announcement would be made "as soon as the sales are complete."

Current and prospective owners of AEA products and software are understandably concerned. Lamb said the new owners would "likely offer warranty and out-of-warranty service to old AEA customers." The ARRL emphasizes that they *cannot* help AEA customers with service or technical problems.

Earlier this year, the company introduced several new products (including the long-awaited DSP-232 multimode TNC) to the amateur market, but "it appears to have been a case of too little, too late," according to the ARRL report. Lamb would not say whether the AEA name would survive the buyouts, but said he expected the new owners would maintain AEA's standards.

Many thanks to the 1997 Communications Monitoring Team. Let's introduce you to some of the people who have looked for, clipped out, and mailed in radio-related columns from their local newspapers. They are:

Mr. or Mrs. Anonymous; Bob Burdick, Meriden, CT; Celeste Howe, Hartford, CT; Ryan Mcarthy, North Babylon, NY; Harold Eads, Fincastle, VA; Kanfi Haloum, Los Angeles, CA; Wayne and Joan Heinen, Aurora, CO; Maryanne Kehoe, Atlanta, GA; Richard Marks, St. Petersburg, FL; Richard Mosley, Wilkes-Barre, PA; Jorge Rodriguez; Ed Schwartz, Chicago, IL; Don Strobel, Lampass, TX; Peter Whitmoyer, Arcola, VA and Don Vest.

Lest we forget, we have consulted the following publications and we list their names in appreciation; *National Scanning, Radio World, Wireless World, WorldRadio, W5YI Report.*

Send your clippings to Larry Miller, "Communications," Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

An Ear to INDONESIA

Located on the other side of the globe, Indonesia poses North American monitors one of the most difficult of monitoring challenges. However, this nation of scattered islands and cultures makes widespread use of broadcasting to overcome its geographic barriers, and reception is not impossible. Arthur Cushen has logged Indonesia throughout its 60 year history of broadcasting. Lest you think he's cheating from his New Zealand location, many of his catches were of mediumwave stations!

By Arthur Cushen
Location photos by Fred Moore

BROADCASTING IN INDONESIA, the former Dutch East Indies, has been controlled by the Dutch, Japanese, and now Indonesian authorities over the past 60 years. Happily, for radio listeners, broadcasting now seems settled into an expansionist pattern.

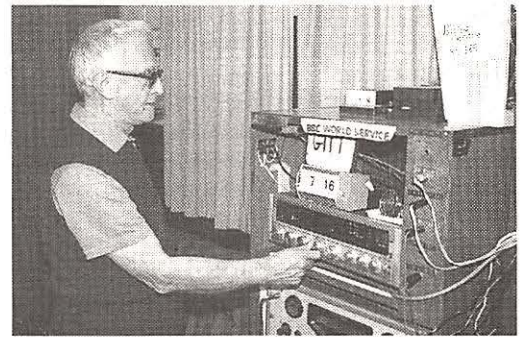
Broadcasting in the former Dutch East Indies was under the Dutch control in the late 1930s when the country was a Dutch colony. The broadcasting service was then known as NIROM: Netherland Indies Broadcasting Co Ltd. Stations were operated in the capital Batavia and other cities as the network expanded during Dutch rule.

In 1938 we were hearing stations such as Radio Batavia, located on Java (now renamed Jakarta), the capital of the Indonesian Republic. Batavia was part of the NIROM radio network; there were 26 NIROM stations on Java and small stations scattered on other islands, as well as other private radio broadcasters in Indonesia.

The Netherland Indies Broadcasting Company Ltd operated many pre-war stations using callsigns starting with YD. The PM callsign was used by other local radio stations, such as the Java Wireless station PMH at Bandoeng, Java. I received verification of a reception report from PMH after the Japanese entry into the Pacific war; the card was dated February 1942. Batavia, Bandoeng, and Surabaya were among those stations heard at my listening post, most of which were regional and used the 60 or 90 meter band.

Japanese Control

By June 1942 the Japanese had over-run the former Dutch East Indies and taken control of radio services, and so we began to hear new voices on the band. Radio Batavia started to use the higher frequency bands and commenced broadcasts in English, full of propaganda of the Japanese war news, lists of prisoners of war and civilian internees. They had a special lunchtime broadcast (0130 GMT) to Australia and New Zealand from Batavia using 18135 kHz.

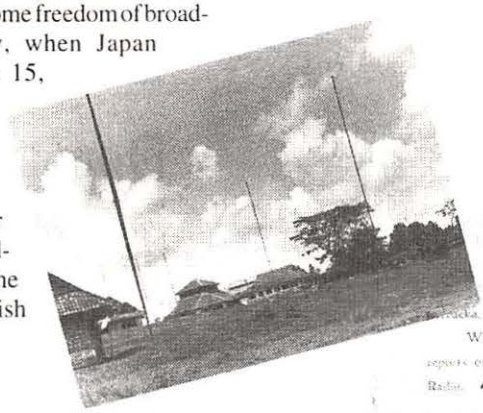


Arthur Cushen

Batavia became one of the main sources for news of the enemy advances, along with many other stations captured by the Japanese—Singapore, Penang,

Manila, Palau, Saigon, Shanghai, Hong Kong, and of course Tokyo. Batavia continued for a short time in Dutch, but then Japanese and English were the main languages used, along with some Indonesian.

The Indonesian population under Japanese control was given some freedom of broadcasting. Subsequently, when Japan surrended on August 15, 1945, the Indonesian free movement began to gather strength as the Dutch returned to take control of their former colony. Indonesian leaders began to emerge as the Dutch tried to reestablish the NIROM network.



Above, transmitter building of Radio Batavia.

At left, a verie from the Java Wireless Society, 1942.

Below, a verie from NIROM, received in 1939

At left, Indonesian Air Force station verie in 1952.

Radio War

By 1946 two broadcasting systems were in operation: Radio Batavia operated by the Dutch in Batavia and the Voice of Free Indonesia (the forerunner of Radio Republik Indonesia) in Jogjakarta under the control of the emerging Indonesian Government. The conflict dragged on as a transfer of power from the Dutch to a new Indonesian Government was under discussion in 1947. The negotiations became reality in 1949 under Sukarno.

In 1966 I noted a student radio on the air and also heard Radio Andir. In fact, during the period from 1945 to 1966 I verified 102 stations, under both Dutch and Indonesian control, and many in the 120-meter band, the best four being YDN 2390, YDA2 2420, YDK6 2490, and YDI6 2330 kHz. The stations ranged in power from 100-300W.

The Current Scene

According to a Radio Nederland program which looked at radio in Indonesia, there are now 647 private broadcasting stations as well as the network of the Radio Republik Indonesian (RRI) stations spread throughout Indonesia. All stations relay the news on the hour from Jakarta; shortwave listeners are already familiar with the news broadcasts which are all preceeded by the *Song of the Coconut Island.*

The majority of RRI stations are on FM and are of low power. On mediumwave the signals on this band are heard at times in Australia and New Zealand, but they are not as consistent as the many signals on the lower shortwave bands.

Today, radio still plays a vital role in reaching the Indonesian population of over 200 million, and small RRI and private shortwave stations will continue to be a challenge to the shortwave listeners on the lower frequency bands.

Indonesian Bandscan

For country counting, Indonesia may be counted as; Bali, Lesser Sundas, Kalimantan (Borneo), Sulawesi, Java, Moluccas, Sumatera, Timur, and Irian Jaya.

Depending on your location, time of the year, and propagation, Radio Republik Indonesia (RRI) stations and non-network stations are most likely be heard in North America as early as 0800-1600 UTC. In November and December, DXers also monitor Indos in the late afternoon (2100-2300 UTC). Many RRI stations broadcast extended schedules during the Moslem holiday season of Ramadan—and may even broadcast all night long.

When reporting to RRI stations, some correspondence may be replied to in English (including Voice of Indonesia); however, to ensure a reply, it is highly suggested you formulate your reception report in Indonesian. I would also recommend you enclose mint Indonesian postage stamps (available from Bill Plum's Airmail Postage & DX Supplies, 12 Glenn Road, Flemington, NJ 0882-3322) along with a self-addressed-envelope and perhaps a prepared QSL card.

Very few stations reply with their own card, but they may include a verification on station letterhead along with your prepared card, signed and stamped.

INDONESIA FREQUENCIES

The following RRI station listings are a sample of those monitored this winter DX season, which will extend only another month or two. Good monitoring and good luck!

Station	Frequencies
Voice of Indonesia (Java)	9525, 15150 kHz English; 0100-0200, 0800-0900, 2000-2100 UTC
RRI Jakarta (Java)	9680, 15150
RRI Fak Fak (Irian Jaya)	4789.11
RRI Merauke (Irian Jaya)	3905
RRI Sorong (Irian Jaya)	4875, 9748
RRI Wamena (Irian Jaya)	4866.45
RRI Pontianak (Kalimantan)	3976.7
RRI Samarinda (Kalimantan)	3295.3
RRI Kendari (Sulawesi)	4000.2
RRI Manado (Sulawesi)	3214.8
RRI Padang (Sulawesi)	4003.2// 6190
RRI Ujung Padang (Sulawesi)	4752.9v
RRI Kupang (Timur)	3384.9
RRI Ambon (Moluccas)	4845
RRI Ternate (Moluccas)	3345
RRI Gorontalo (Sumatera)	3264.6v
RRI Pekanbaru (Sumatera)	5040
RRI Tanjungkarang (Sumatera)	3395
RRI Tanjung Pinang (Sumatera)	3224.8

Prepared by Gayle Van Horn

Amtrak's New Flexliner is a Golden Opportunity To Go Scanning

By Laura Quarantiello

There's just *Something* about a Train ...

The steel rails start a foot in front of my toes and run off to my left into the distance, converging to a sharp point focused on infinity. Standing there, perched just behind the yellow "stand back" line painted on the concrete at railside, I squint and watch. And I wait.

There can be a lot of waiting when it comes to trains, as I'm beginning to learn the hard way. Even though trains run on a pre-set schedule, nothing is absolute and delays are not uncommon. I'm new at all this, but it's a beautiful Southern California day and I have my scanner with me, so I'm not too quick to complain. Besides, I'm not alone here; there is a crowd of about one hundred gathered at the Oceanside station, milling around, leaning out to peer down the tracks, tapping their watches, waiting. We're all here for the same reason, because there's just something about a train.

For years, people have chased trains and scanner listeners have tuned in to the chatter of the men who run big iron on the rails. They will travel far and wide, stand out in the middle of nowhere with a scanner and a camera, just to catch a glimpse of a locomotive, just to hear the engineer's call over the radio as he crosses a right of way, heading for the next station. There's a little bit of heaven in the rumble of the wheels and the long, low moan of the train whistle.

I didn't start out as a train watcher and I'm still not sure that I deserve to claim the official title, but like any good scanner listener, I'm always up for a new scanning challenge. When Amtrak announced that their newest passenger train, the Flexliner, would be passing through San Diego on its nationwide tour, I wasted no time marking my calender. Here was a golden opportunity to try my hand at scanning the rails. There was only one problem ... I knew nothing about trains.

Zero to Sixty: Learning the Rails

I had a grand total of two days—forty-eight precious hours—in which to bring myself up to speed on monitoring trains before the Flexliner pulled into town. It may sound like all the time in the world, but when you're chasing radio signals—those elusive and short-lived phantoms of sound—every second counts. I snipped a newspaper article about the train's tour and studied it for clues.

Amtrak's Flexliner is a European-designed passenger train manufactured by Adtranz, a 50/50 joint venture between transportation company ABB Asea Brown Boveri Ltd., and Daimler-Benz. Billed as Amtrak's vision of 21st Century American rail travel, the Flexliner operates under either electric (EMU) or diesel (DMU) power and is self-propelled, requiring no locomotive.

Stationed at each end of the train are two engineers in control booths that emulate a locomotives' operating panel. The train is bi-directional, and through use of an automated coupling connection system, individual trains can be joined and separated within minutes, even while underway. Each train consists of two to four cars, and up to five trains can be connected to comprise one trainset.

Designed for quick acceleration, the Flexliner can reach speeds of 112 miles per hour on existing rails. A true product of the age, the train is equipped with a computerized diagnostic system and features a rubber front and fold-back doors allowing access between coupled trains. The coupling system and independent control booths allow one modular trainset to leave a station and separate, becoming several trains all headed in different directions.

The Flexliner was scheduled to start out the day in Escondido, a city nearly thirty miles north of San Diego, board a load of VIP's and media types, and then chug down to the main station in Oceanside, California. It would use existing Atchison, Topeka, and Santa Fe railroad tracks for the trip and was due for arrival in the seaside city at 2 pm. So now I had background, location, and time. All I needed were frequencies.

I immediately went to my rack of frequency books and pulled down one after the other, flicking pages and checking for rail frequencies. When you're in a bind and looking for numbers, always go to your frequency books, because any and all information is helpful to narrow down the search, even if they don't provide the exact answer.

The railroad section of the radio spectrum, I discovered, was neatly fastened between a lower and upper limit of 160.215 MHz - 161.565 MHz. Though I paged through many books, all I really needed was the spectrum allocation listing, because it gave me a target range. Luckily, most railroads use one or more frequencies within this particular range, so searching wouldn't turn out to be a whole day affair. My PRO-43 zips through the search in about five seconds. I loaded up this range into my search bank; it would be my backup in case any of the specific frequencies I would be monitoring didn't yield any communications.

While it's true that railroads use frequencies in other bands, such as the 450, 460, and 470 MHz bands, the 97 AAR frequencies (see

The passenger sections look normal enough, but one glimpse of either end shows that this train is something different.

sidebar for conversion chart) are the most common. Most locomotives come fully equipped with radios that synthesize the appropriate frequencies just by setting the appropriate AAR channel identification number on the radio. A window on the radio displays the AAR channel number for transmitting and the AAR channel number for receiving. As an example, Amtrak often uses a road channel of 160.455 MHz. The window on the train radio would show 2323, depicting transmission on AAR channel 23 and receiving on channel 23.

By wiping out half of the entered frequencies in my PRO-43 and loading the AAR frequencies into the channels corresponding to their official numbers, I could have instant access to any rail freqs, simply by punching in the appropriate channel number. This may be an option for you if you scan the rails frequently and at different locations. For my hunt, it was enough to know that 160.560 (AAR Channel 30) was the frequency Amtrak trains tend to use on Santa Fe tracks.

Whenever you go scanning for a particular target, it's wise to empty out one bank of your scanner and load it back up with "possibles"—frequencies that may see use by your target service. On my PRO-43, I use bank ten, just because it's handy and easy to remember. I entered several likely frequencies, such as the Santa Fe Road channel, and locked out the rest of the channels in the bank. The unused channels would be available for any hot frequencies I might come up with while searching.

Researching your target before the actual day of monitoring is always wise. I searched the Internet's World Wide Web, CompuServe's HamNet Forum, and any other resource I could find that might have information on railroads. Needless to say, I discovered a great deal, much of it nearly useless errata that wouldn't help me when it came time to actually listen in. Nevertheless, I learned a great deal about railroads and trains.

The day before the Flexliner's arrival, I punched the 160 MHz range into my PRO-2006's search bank and went hunting. I had never done too much listening to rail communications, happy enough in the knowledge of the frequency of the local line that runs through my city three times per week. Now, however, I became a railroad junkie: I wanted to grab and identify every active rail frequency. I was on a mission, a crash course in railscanning.

With a frequency book, paper, and pen in hand, I worked the railroad range forward and backward, up and down, noting every active frequency and who it belonged to. I used every spare minute I had to become familiar with that one megahertz swath of numbers. And in the end, the research all paid off.

Trackside

I never dreamed that a new train would bring so many people out of the woodwork. There is media here and Amtrak officials, as well as representatives from Adtranz, the train's manufacturer. And there are people ... lots of people. The Oceanside Transit Center, point of arrival and departure for Amtrak trains, as well as the Coaster commuter rail line and district buses, sits just minutes from the Pacific Ocean. It is a place of transition and that is reflected in the mix of faces around me. Many have brought cameras, some have taken their children along. Some look bewildered, wondering what all the fuss is about.

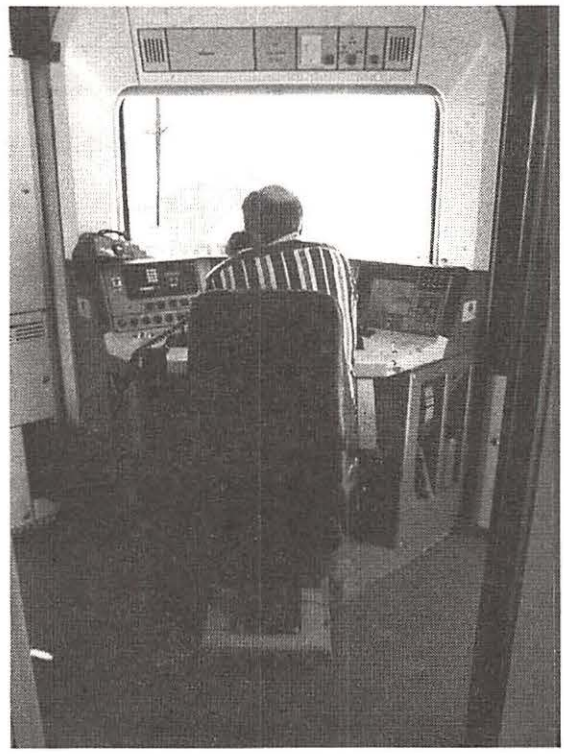
I find a space away from the crowd, slip on a pair of headphones, and switch on the PRO-43. The airwaves are dead and the scanner runs through the scan bank several times before I give up and punch in the search bank. Someone has to be talking, somewhere. Over my head, the public address system clicks on and a woman's voice tells us that the Flexliner has been delayed but is expected to arrive within minutes. There will be a short ceremony and then we will allowed to board and explore the train.

I switch back to Bank 10, where my best bet frequencies are entered, and wander over to the tracks. Leaning out, I look down the long expanse of shiny straight metal. It's in this moment that I experience one of every scanner listener's worst nightmares: what if I can't find the frequency? I've done my homework, entered in all possible Amtrak frequencies for this area, as well as those in use by the AT&SF local line. But, what if they are on UHF? Not likely, but certainly possible. Do I have time to search the 450, 460, and 470 MHz ranges? One of those obscure rules of scanning runs through my head: stick with the plan.

Finally, way down in the distance, where the tracks merge into a single line, there is a light. Almost simultaneously, something breaks squelch on my handheld. I snatch it off my belt, but it's too late, the scan cycle is continuing and I missed the frequency. The P.A. system comes on again and an announcement warns spectators of the train's arrival. I'm so close, I can taste the frequency. Staring at the scanner display, I will someone to talk. Just once, just for a second. This is what it all comes down to, just me and the scanner and a voice I can't catch. All the homework in the world won't help if no one will speak.

I lean out over the yellow line on the concrete, watching the light coming down the tracks.

There's a slight rumble, a vibration of heavy metal. "Central, 7003 arriving Oceanside."



Bingo! 160.560 MHz comes alive and I jab the "manual" button. After all that searching, all the possibilities, my first bet was the best one. The train has taken shape behind the light now, but there's something wrong. I'm no train expert, obviously, but this one has no engine. As a matter of fact, it's the strangest-looking train I've ever seen. Slowing into the station, the front end of the Flexliner is a black puffy donut surrounding a window with a single wiper on it. Close to the tracks is the familiar cowcatcher, but it's recessed and painted with glaring black and yellow stripes.

The brakes roar and the train slows, inches forward, stops. The passenger sections look normal enough, but one glimpse of either end shows that this train is something different.

All Aboard

In the curiously small control booth, the engineer is speaking. Standing by the open door of the compartment, I watch his lips move as his voice comes over the

scanner speaker. "Central, 7003. We'll hold here for a few minutes and wait for the second trainset. Then we'd like to recouple."

"7003, roger. 7004 will be cleared into the west platform and then back onto the main track for recouple."

Somewhere back up the line, the Flexliner's second trainset had uncoupled and slowed down while the first sped ahead into the station, demonstrating the versatility of this modern machine. The crowd has migrated down to where I'm standing by the first trainset. Some stare expectantly at the passenger doors, waiting for their chance to go aboard. They don't know what I know, that it'll be a few minutes before all is ready. The blue-coated conductor walks down, handheld ready and I hear his voice on the radio.

"Where do you want to board from, John?"

"First doors on the second trainset, once it gets here."

Ah-ha! While everyone is down here expecting to board, I walk back up the tracks to the end of the train and wait for 7004's arrival. There is more chatter on the scanner as the second trainset approaches the station, then the engineer's chant of "two cars, one car, that'll do" as the two trainsets couple. It's a fascinating evolution to watch and monitor. The Flexliner tour trainset is a diesel multiple unit (DMU) which includes two three-car Flexliner trains. Throughout the tour, Amtrak will demonstrate the unique coupling and bi-directional operation systems.

Up the tracks, at the other end of the train, the conductor is talking to the crowd and he's pointing in my direction. Suddenly, there's a shift and everyone starts to move my way. I brace for impact as the crowd stampedes for the second trainset and before I know it, I'm no longer first in line for boarding. The conductor pushes to the front and stands by the closed doors. "John, can we open the doors now?"

It takes three or four minutes and an eternity of standing shoulder to shoulder with the crowd before the engineer releases the doors. I'm fifth aboard and immediately seek a seat as everyone else streams down the aisle. In the relative comfort of the coach compartment, I watch the long line outside the panoramic window while listening to departure preparations on the scanner.

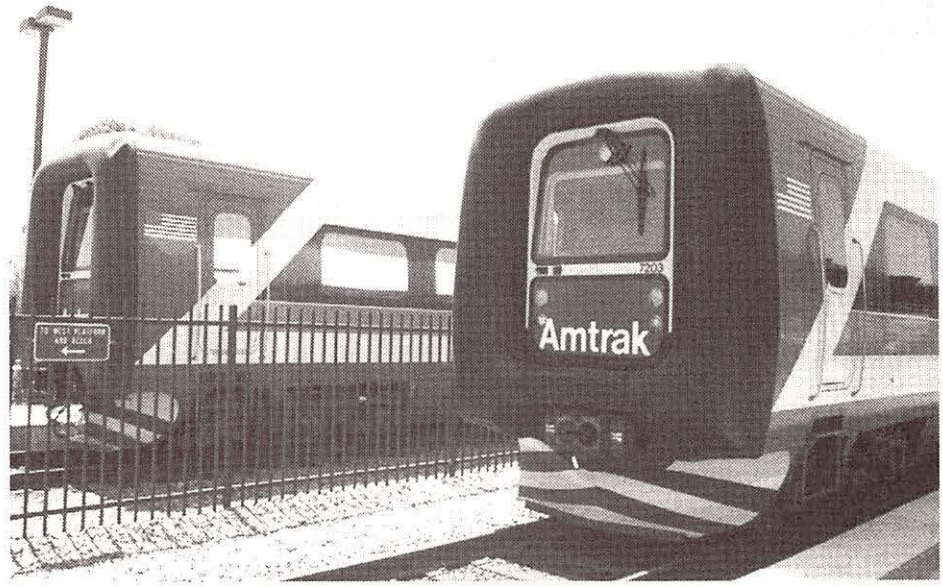
Of course, passenger comfort is not secondary on the Flexliner. The interior features wide-aisled compartments and large windows, along with reclining seats. Audio systems, as well as outlets for laptop computers are available at each seat. Electronic displays show train schedules and routes, and cellular phones are available for passenger use. If the Flexliner catches on in America, rail travel will never be the same. And for scanner listeners looking for a new scanning opportunity, well ... there's just something about a train.

Demonstration Information

Currently, there are approximately two hundred Flexliner trains operating in Denmark, Israel, and Sweden. Spain is expected to begin using the Flexliner soon. Though the train operates up to 112 mph in European service, the touring trainset will not exceed 90 mph due to track conditions. The Flexliner was unveiled to the public in Las Vegas, Nevada, on July 12, 1996, and the tour was

officially launched in Los Angeles on July 16. The train operated in California for one month with several special excursions, stationary equipment displays at various Amtrak stations, and even participated in regularly scheduled Amtrak San Diegan service between Los Angeles and San Diego from July 21 through August 1.

At the end of its California tour, the Flexliner left for five months of demonstrations in Canada, returning to the United States in March 1997. The tour schedule is still in development, but the train will remain in North America for two years. Local, state and regional transportation officials interested in bringing the Flexliner to their area are asked to contact Ron Hartman at (202) 906-2642. For inquiries about future Flexliner tour locations, contact Amtrak public relations.



AMTRAK SAN DIEGO AREA FREQUENCIES

160.560 Amtrak San Diego Road Channel
161.550 Amtrak Los Angeles Road Channel
161.055 Amtrak Administration and Police
160.455 Amtrak Train End to End
160.455 Amtrak Yard Channel

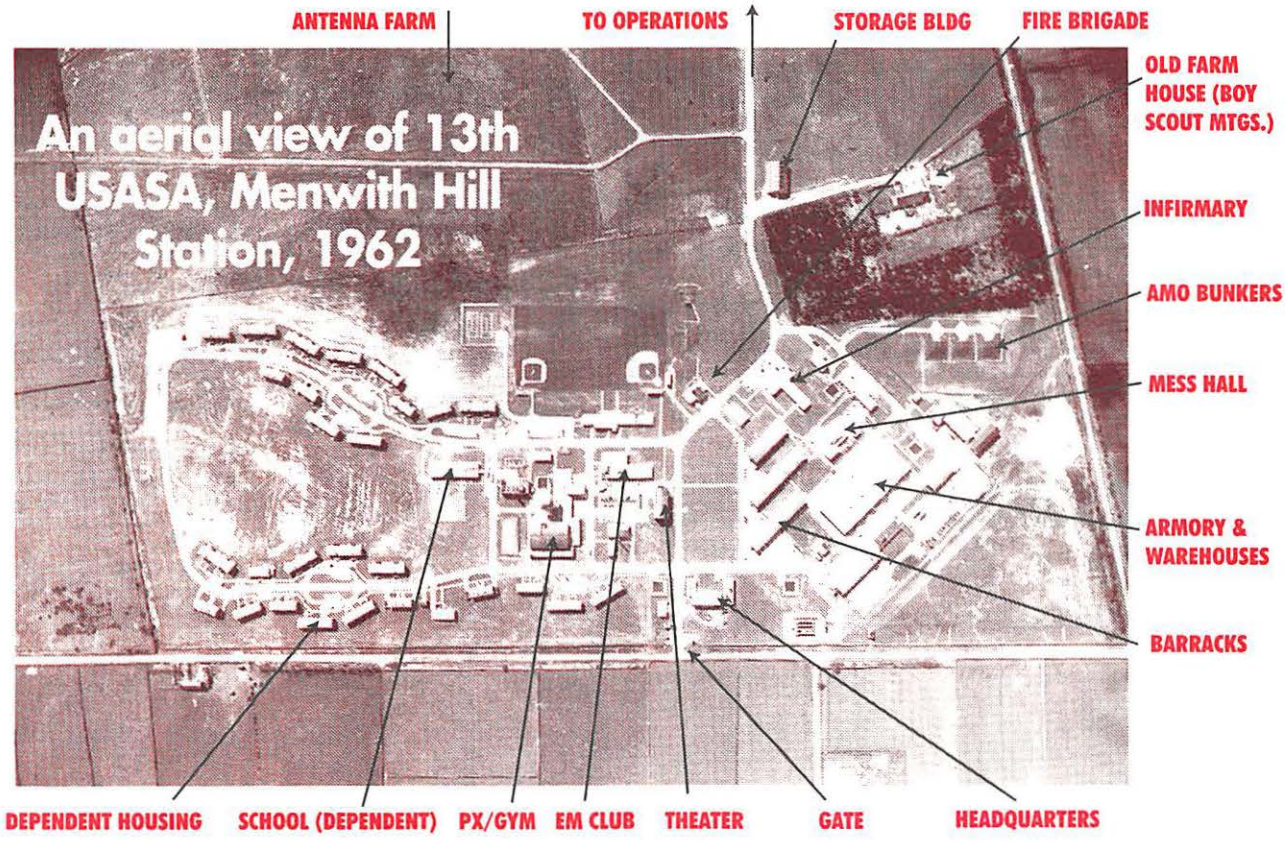
AAR RADIO CHANNEL NUMBERING

02 159.810	34 160.620	66 161.100
03 159.930	35 160.635	67 161.115
04 160.050	36 160.650	68 161.130
05 160.185	37 160.665	69 161.145
06 160.200	38 160.680	70 161.160
07 160.215	39 160.695	71 161.175
08 160.230	40 160.710	72 161.190
09 160.245	41 160.725	73 161.205
10 160.260	42 160.740	74 161.220
11 160.275	43 160.755	75 161.235
12 160.290	44 160.770	76 161.250
13 160.305	45 160.785	77 161.265
14 160.320	46 160.800	78 161.280
15 160.335	47 160.815	79 161.295
16 160.350	48 160.830	80 161.310
17 160.365	49 160.845	81 161.325
18 160.380	50 160.860	82 161.340
19 160.395	51 160.875	83 161.355
20 160.410	52 160.890	84 161.370
21 160.425	53 160.905	85 161.385
22 160.440	54 160.920	86 161.400
23 160.455	55 160.935	87 161.415
24 160.470	56 160.950	88 161.430
25 160.485	57 160.965	89 161.445
26 160.500	58 160.980	90 161.460
27 160.515	59 160.995	91 161.475
28 160.530	60 161.010	92 161.490
29 160.545	61 161.025	93 161.505
30 160.560	62 161.040	94 161.520
31 160.575	63 161.055	95 161.535
32 160.590	64 161.070	96 161.550
33 160.605	65 161.085	97 161.565

AMTRAK POLICE RADIO CODES

10-00 ..... Emergency Broadcast all units standby
10-01 ..... Receiving poorly
10-02 ..... Receiving well
10-03 ..... Priority Service
10-04 ..... Acknowledgment
10-05 ..... Repeat message
10-06 ..... Busy, unless urgent
10-07 ..... Out of service (location)
10-08 ..... In service (location)
10-10 ..... Vehicle/Person Check (location/description of vehicle/occupants)
10-11 ..... Request additional APD units (routine assistance)
10-12 ..... Request Supervisor (location)
10-13 ..... Request Local/State Police (location)
10-14 ..... Request ambulance/rescue squad
10-15 ..... Request fire apparatus
10-16 ..... Prisoner(s) in custody (mileage start/stop)
10-17 ..... Check wants/warrants (NCIC)
10-18 ..... Request to HQ
10-19 ..... Call HQ by land line
10-20 ..... Location
10-21 ..... Call...
10-22 ..... Disregard
10-24 ..... Alarm sounding (location)
10-26 ..... Prepare to copy
10-33 ..... Does not conform to regulations/unnecessary use of radio
10-36 ..... Time check
10-41 ..... Begin tour of duty
10-45 ..... Accident (specify auto/train, etc.)
10-46 ..... Train in Emergency
10-47 ..... Train protection (non-emergency)
10-48 ..... Stoning/shooting/vandalism
10-49 ..... Passenger/patron assist
10-50 ..... Disorderly crowd/person/disturbance
10-77 ..... E.T.A.
10-82 ..... Hostage situation
10-88 ..... Bomb threat
10-90 ..... Arrived at scene
10-95 ..... Enroute to...
10-99 ..... Assist officer

Menwith Hill Station



An aerial view of 13th USASA, Menwith Hill Station, 1962

A Case Study in Signal Intelligence Gathering during the Cold War

By Kenneth L. Bird, N9JLW

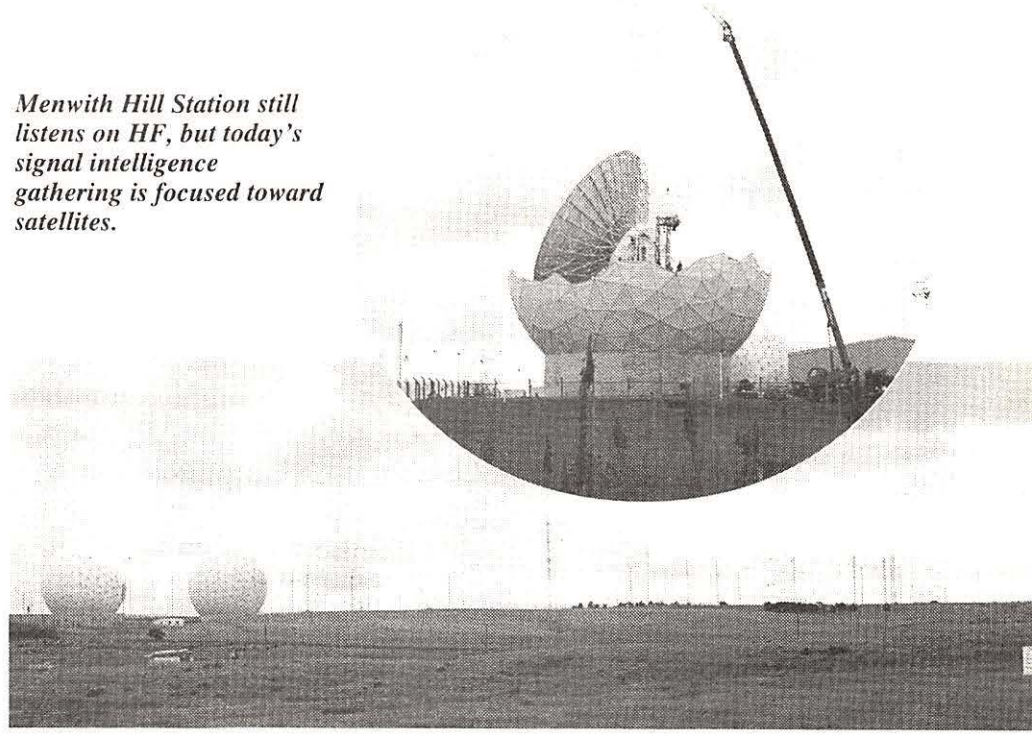
The monitoring of communication signals has long been performed by agencies of world governments since the first signals were sent out on spark gap transmitters at the turn of this century. As technology advanced, so did the techniques and methods of gathering information by electronic means. The Second World War saw an explosion in electronic intelligence technology application, which became even more important in the cold war years that followed. The following is a thumbnail history of the prime United States agencies involved in monitoring electronic communications and one major location where it continues today.

The Origin

On November 4, 1952, President Harry S. Truman, signed a directive creating a super-secret government agency known as the National Security Agency (NSA), which, according to Mr. Truman, "would perform highly specialized technical and coordinating functions relating to the national security." The NSA (or "No Such Agency" to its members), was to become a powerful weapon at the height of the cold war.

Two years later, in 1954, the British War Department approached a Mr. S. Robinson to purchase his 246 acre "Nessfield Farm," situated in the Yorkshire Dales near the spa town of Harrogate. The land, described as a "strip of barren, marshy, windswept wasteland which is of little value for anything except for grazing a hardy breed of sheep," was known as Menwith Hill, or "stoney field" in 14th century English.

The original 246 acres of Menwith Hill were soon increased to a total of 562 and quietly leased to the U.S. Department of Defense. Soon workmen began surveying the area for what would be the 13th USASA (U.S. Army Security Agency) field station.



Menwith Hill Station still listens on HF, but today's signal intelligence gathering is focused toward satellites.

The U.S. Army Security Agency

The U.S. Army Security Agency was an expansion of the early U.S. military involvement in communications security (COMSEC), signals intelligence, (SIGINT), and cryptanalysis—the coding and decoding of communications. The value of listening to messages sent via radio had been seen in World War I, where both the Army and Navy practiced the interception of continuous wave (CW or Morse) coded signals transmitted by the Kaiser's military units.

The period between the World Wars saw great developments in radio communications and its employment by governments and the military. In the U.S., however, signals intelligence had languished and was only kept alive by the efforts of a few dedicated individuals in both the military and State Department. In response to growing threats in the 1930s, the U.S. Army established a separate organization known as the Signals Intelligence Service or SIS.

The general mission of the SIS was stated in a memorandum dated April 22, 1930, as:

> "The preparation of all codes, ciphers, and other means of secret communications to be employed by the army in peace and war. In time of war, the interception of enemy communications by electrical means, the location of enemy transmitters by goniometric (electronic detection finding) means, and in peacetime, the necessary organization and training of personnel and the development of equipment to render the service capable of immediate operation in time of war."

At the outbreak of World War II, the SIS was expanded and the military designation was changed six times during the war years until on September 15, 1945, the U.S. Army Security Agency was the final name selected. The USASA was headquartered at a former girls school in Arlington, Virginia, known as Arlington Hall; a location near Warrenton, Virginia, known as Vint Hill Farm, was used as a primary monitoring and training post. With the end of that war, the USASA mission was reduced and the Agency was almost disbanded. But then came the "cold war," and the USASA regained its role as the main army signals intelligence organization.

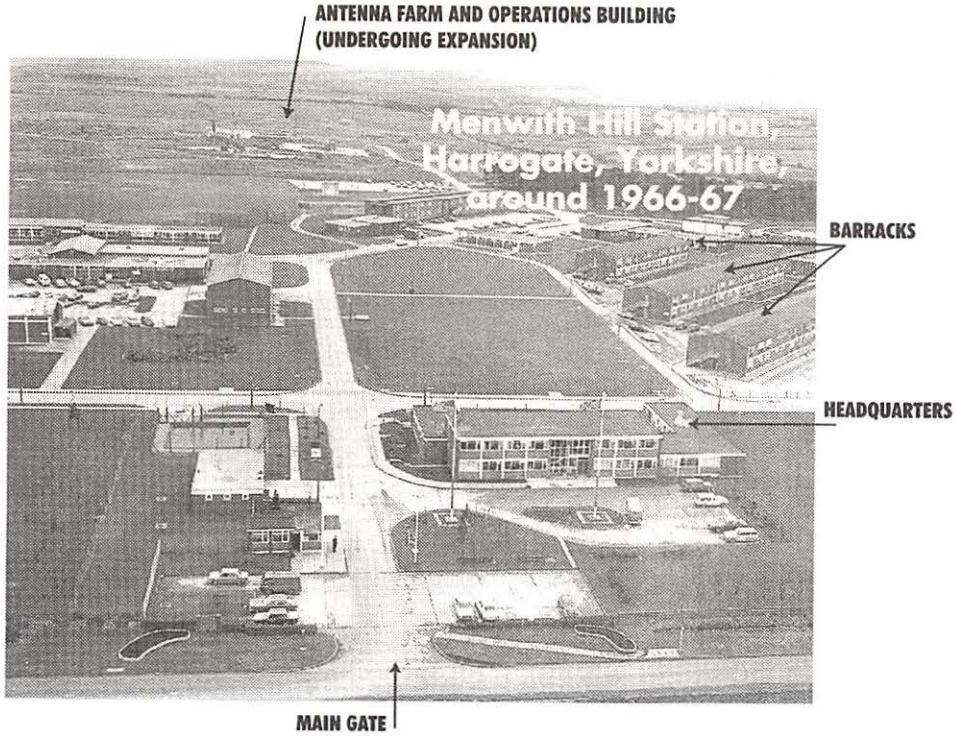
As the cold war grew in intensity, the need for a broader intelligence gathering role for the military resulted in the creation of NSA. This agency relied on the signal and communications gathering capability of the ASA and other military security services, using their resources on sea, air, and land. Members of the Army Security Agency were selected from the top ten percent of those who scored high on the army profile tests given at induction or enlistment. Candidates were given indepth background checks and would be granted the highest security clearances. Most USASA members received training up to a full year at the "Intelligence University" which was located at Fort Devens, Massachusetts.

Construction and Operation

The U.S. Army was in the forefront in the search for improved signals intelligence capability. Construction at Menwith Hill commenced in April of 1956. The workmen at Menwith Hill were soon joined by four USASA officers and three enlisted men.

Due to problems with soil and weather conditions, it took four years to complete the facility. The cost of construction was billed at $6,800,000 plus another $1,200,000 for dependent housing. The facility underwent several name changes: Originally designated Field Station 8613, the site was formally named 13th USASA field station on January 1, 1957. In January 1959 it was named Menwith Hill Station. It became operational in June of 1959 with the arrival 32 USASA troops, which by 1960 had increased to 450. The unit was assigned to ASA Headquarters in Frankfort, West Germany, and attached to the third Air Force United Kingdom, for logistic purposes.

The Station consisted of a headquarters and service company, which provided logistical and technical support, and an operations company, whose members performed the ac-



tual missions as designated by NSA and the military. The major facilities consisted of an operations building, located in the huge antenna field one mile from the main post area. This building was self-contained, with an emergency power plant and double chain link security fence.

The main post had the headquarters buildings, barracks, and a large dependent housing area, along with necessary support buildings such as mess hall, chapel, movie theater, base store (PX), and the ever-popular officers and enlisted personnel clubs. Three earth-covered bunkers held ammunition and Thermite charges for the destruction of classified equipment, should the post ever be overrun by the enemy. By 1963, over five hundred USASA troops were in residence at Menwith Hill.

Menwith Hill proved to be an ideal location for signals intelligence gathering, with its low radio frequency (RF) noise location and proximity to the northern sectors of Western and Eastern Europe. The large antenna field contained huge directional rombic antennas that could scoop up high frequency (HF) signals worldwide; even high altitude missile test information was read by the Menwith Hill operators. The obvious targets of the day were Warsaw Pact military units and the Soviet Union. Other missions involved "friendly" NATO nations and their organizations. Many of the mission-specific targets of the 1960 decade remain classified to this day.

Menwith Hill was viewed by the local British residents as just another United Staes military base—one of many that dotted the English and Scottish landscape in the aftermath of World War II. There had been a large contingent of Yanks at an Army hospital in the near by town of Harrogate during that war, and many of the locals had pleasant remembrances of the GIs. Menwith Hill was viewed as an asset that employed many of their relatives and friends.

The post was generally an open facility with gate security supplied by a U.S.Army military police (MP) detachment and the British Air Ministry Police. The curious did constitute a problem for the base security officer, and Soviet and Eastern block operatives made many trips to Harrogate on "holiday." Also there was a barber shop in the nearby town of Harrogate that had a most inquisitive barber, and GI's were warned to avoid the location and advised to get a haircut elsewhere, without the inquisition.

Despite the potential for security breach the base never suffered a mission compromise, although there were events such as an "IRA" raid on the ammunition bunkers and an occasional workman who strayed into the operations building, much to his displeasure and that of the post commander. During the 1970s and 80s many "Ban The Bomb" demonstrations were held outside the main gate and access to the facility was subsequently tightened up.

One story Menwith Hill never denied resulted from the presence of U.S. Naval personnel at the base. Most were there to take part in athletic competitions and the weekend dances held at the enlisted men's (EM) club. When she asked what the sailors were doing there, an English female guest was told that they were members of a *Polaris* submarine crew that was being refitted at the huge underground facility beneath Menwith Hill. The submarines came in through a huge tunnel that had been constructed from the North Sea. The sailors warned their dance partners not to breath a word of the story and, of course, it was all over Yorkshire in a week and even resulted in a inquiry from a London newspaper.

Operations

The highly trained military staff of the station worked a twenty-four hour shift every day of the year. At shift change time, the duty officers would be briefed on mission status, and the operators would relieve their counterparts. The operations building was divided into large rooms, each air conditioned and fed power and RF signals through floor ducts. (A great deal of heat was produced in the operations building by the mostly vacuum tube type of equipment then in use.)

"Cover" music was played constantly both in the rooms and in the perimeter area of the building—mostly rock music from then-operating shipboard pirate radio station *Radio Caroline*! ASA personnel would periodically "sweep" the building for possible "bugs" and to check the overall security of the facility.

Every conceivable form of RF signal within the high frequency bands were gathered by the equipment in the operations area. CW and voice signals along with compacted signals called "burst" transmissions were recorded on military versions of the famed Ampex tape recorder. Many CW signals were monitored live by operators called "ditty boppers" using manual typewriters. Some signals were copied on facsimile machines and paper tape; others, in FSK mode (frequency shift keying) were demodulated by an "AFSAV 65" that used interchangeable modules to decode various FSK configurations. These signals were sent directly to model 28 teletype machines for printout.

Critics of Menwith Hill today claim the facility taps international telephone traffic from a nearby British Telecom microwave tower. It would certainly be possible with the technology of today. Such activities were never performed during the USASA command of the facility and, even if possible, would have had no value to the main missions then in process.

The heart of the operations building was the "comm center" where the cryptographers worked with their deciphering machines. Few at Menwith Hill were cleared for this highly secret duty and many veterans of the 13th USASA still refuse today to discuss what they did in that inner sanctum. Much of what was

collected at Menwith Hill was sent encrypted by land line under the sea to NSA at Ft. Meade, Maryland, for final processing.

The communications center was fed signal intelligence provided by the finest hollow state HF receiver ever conceived, the Collins R390A. Menwith Hill had over two hundred of these radios, and they were kept in excellent condition by a radio repair lab located within the building. The radio featured a mechanical "digital" readout and a dynamic range rivaled by few of our present-day microprocessor-controlled radios. The gear train that indicated the frequencies is still a marvel of mechanical engineering, and many monitoring hobbyists still seek out these fine machines at swap meets and hamfests.

The R390A radios were fed RF signals from a large patch panel consisting of hundreds of jacks that terminated the coaxial cables from the antenna farm. Signals could be manually patched from this panel to any position in the various equipment rooms. All signals were received live; it was never dreamed that it would be possible to record and play back the desired portions of the RF spectrum and then search for a signal at will, as is done with today's technology.

Most activity in the operations building was routine and even tedious. Copying live code for eight hours was not always fun. Tending the various recording devices and finding new mission frequencies on the R390A were the main diversions from the norm. At times, alerts were called and the operators practiced equipment destruction procedures. Thermite charges capable of melting down radios and crypto machines were on hand in case World War III broke out and Soviet troops were to arrive at the station gates. While M-14 rifles were available in the base armory, Menwith Hill depended primarily on Her Majesty's Royal Regiments to defend it against any invaders.

Civilian Takeover and Expansion

Menwith Hill was under the command of the USASA for only six years when it was taken over entirely by NSA civilians. On August 1, 1966, NSA assumed control of the facility, replacing the commanding officer with a civilian "station chief." The remaining USASA operational staff were transferred to other locations. Many were destined for Southeast Asia to join ASA operational units already in place, and the peaceful damp cold of Yorkshire was replaced by the dangerous steaming jungles of Vietnam and Laos.

The main reason for the NSA takeover was the evolving technology of the digital computer, coupled with space-based Signals Intelligence Gathering. USASA personnel enlisted for relatively short terms, and there was not a sufficient number of qualified career members. The new technology required the expertise of highly trained civilian technicians and engineers provided by NSA and its various contractors, such as Lockheed and Ford Aerospace, and IBM, who were building the new computers and satellite systems.

The technology of the 1970's and 80's brought many changes to the facility. Many new buildings were erected on the base, the operations building was enlarged, and huge white radomes hid the many satellite collection and transmission dishes that were now in use. The HF antenna masts are still in use, however. As one passes the base on the A7 road between the towns Skipton and Harrogate the radomes look like giant golf balls with the tall masts marking the putting green in the background. Signs warn of trespassing being subject to the "National Secrets Act," and photography is frowned upon by the local police.

The mission of Menwith Hill may be changing once again, for in 1995 the U.S. Army Intelligence and Security Command (INSCOM), which replaced the Army Security Agency in 1972, again took command of the station. One can only speculate on why the NSA gave Menwith Hill back to the Army. According to an unnamed source at INSCOM, the break-up of the Soviet Empire created more potential "bad guys" that the U.S. intelligence community must keep up with. Menwith Hill still plays a large part in the information collection necessary to thwart the such enemies, a role which may seem better suited to the military.

Monitoring hobbyists and intelligence buffs who might be tempted to visit Menwith Hill while on vacation in the United Kingdom are advised not to try to do so. It is still a very secure facility and visitors without official business are not admitted. Any type of trespassing may get you sentenced to a not-so-comfortable UK prison. Just enjoy the drive around the base on the public roads and then go find a nice pub in the area and enjoy the hospitality of Yorkshire—leave Menwith Hill Station to the professionals.

A home page for those who served at the 13th USASA station.

For thirty-six years, Menwith Hill Station has been a premier electronic intelligence gathering location for the U.S. Army and the National Security Agency. The information gathered by Menwith Hill no doubt influenced the Berlin crisis, the Cuban missile crisis, the space race, the Vietnam war, the break-up of the Soviet Union, and the Gulf War. Even as this is written, the huge radomes at Menwith Hill gather information that continues to affect the U.S. response in hot spots around the world today. Perhaps someday, as with "ULTRA" or the "Manhattan Project," the detailed story of Menwith Hill will be revealed. Until that time, the major contribution made to our nation's security by those who have served, and continue to serve there will remain largely unknown.

On cold winter evenings, the writer enjoys sitting in front of his R390A basking in the glow of the vacuum tubes, and at times, in the noise of the headphones he thinks he can hear signals from Tashkent, or rocket a launch from Tyuratam, or the taut "fist" of an East German command post—all "cold war" ghost signals from the past of Menwith Hill Station.

POSTSCRIPTS:

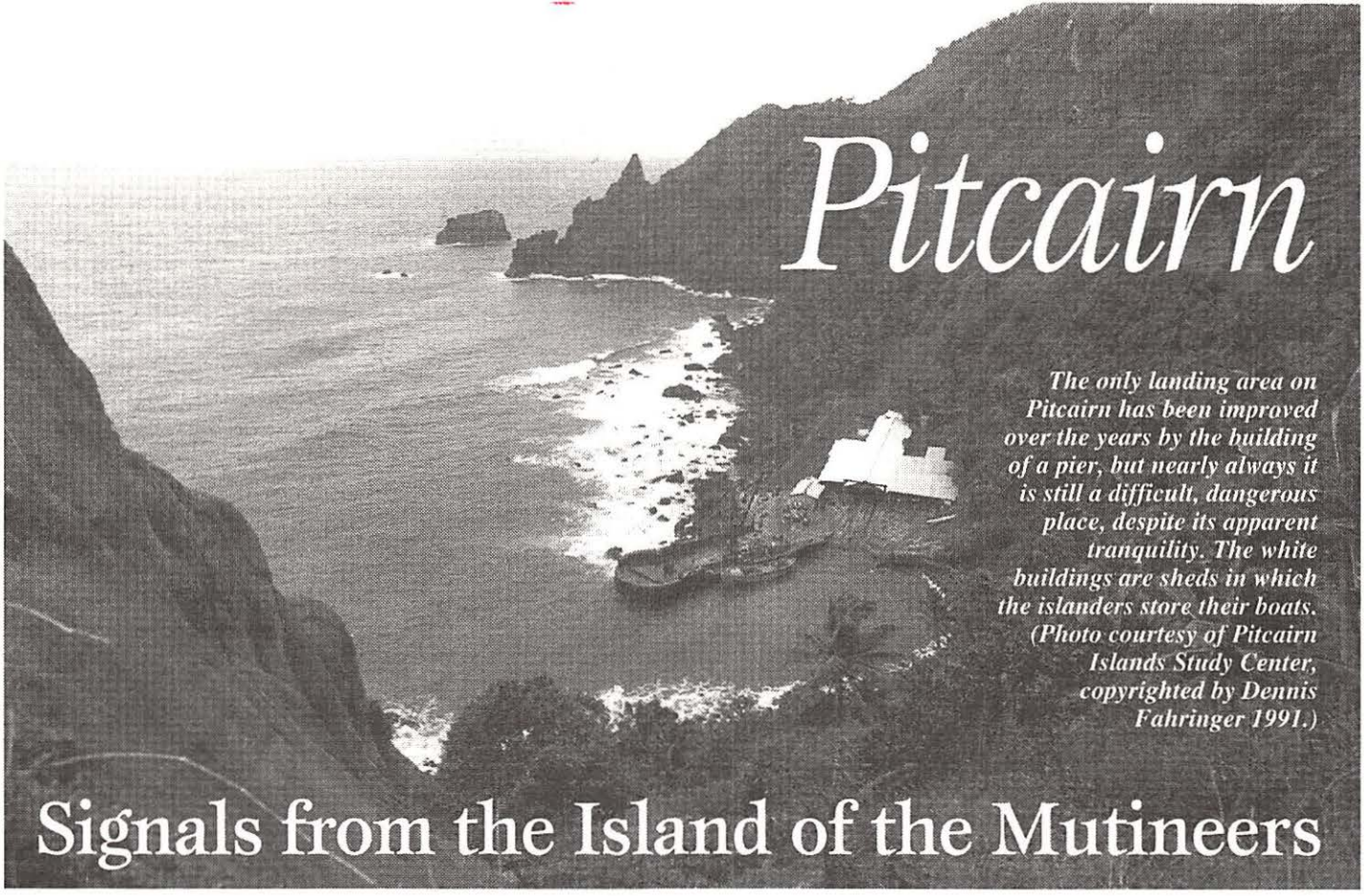
In 1990, a few veterans of the 13th US Army Security Agency Field Station formed an association. The group meets every two years and has located over 500 former USASA members who served at Menwith Hill. The association can be contacted at:
13 USASA Field Station Association, P.O. Box 585, Fayetteville, NC 28302-0585
Internet Page: **http./www.greywolf.com**

The writer is indebted to Mr. James Gilbert, the command historian of the U.S. Army Intelligence and Security Command, for supplying information on the origins of the site of Menwith Hill and the early days of construction.

The writer served at Menwith Hill Station from 1963 to 1966. This article is based partly on that experience and information from the following sources.

Bramford, Peter, *The Puzzle Palace*, Penguin Books
Campbell, Duncan, *The Unsinkable AirCraft Carrier*, Micahel Joseph (United Kingdom)
Brownell, George, *Origin and Development of The NSA*, Aegean Park Press
Editors, *Origins and Development of The USASA*, Aegean Park Press
Finnegan, John P., *Military Intelligence, a Picture History*, US Government Printing Office

Editor's note: Readers may also be interested in *The Codebreakers* by David Kahn, reviewed this month in "What's New?"



Pitcairn

The only landing area on Pitcairn has been improved over the years by the building of a pier, but nearly always it is still a difficult, dangerous place, despite its apparent tranquility. The white buildings are sheds in which the islanders store their boats. (Photo courtesy of Pitcairn Islands Study Center, copyrighted by Dennis Fahringer 1991.)

Signals from the Island of the Mutineers

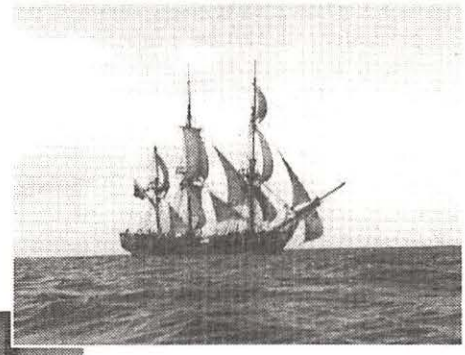
By Leon Fletcher

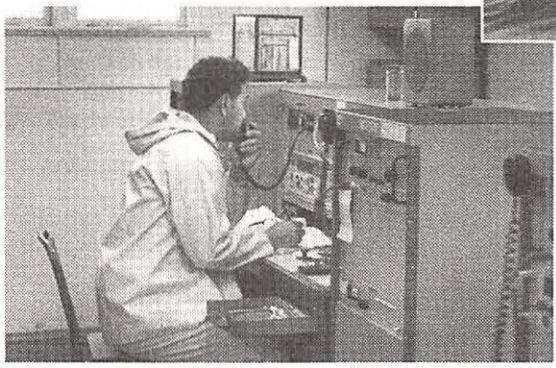
"CQ, CQ, CQ—THIS IS VR6 . . ."

Hearing that call is one of the biggest thrills ever for many radio enthusiasts. It's significant for two reasons. First, CQ (calling any station) from VR6 usually attracts immediate attention from numerous shortwave listeners. The second reason hearing that call is a thrill: the call VR6 comes from one of the most intriguing spots in the world—Pitcairn Island. (Pronounced Peet-kern by residents.)

Often that call comes from VR6TC—Tom Christian, sixth generation direct descendent of mutiny leader Fletcher Christian of *His Majesty's Ship Bounty*.

Tom is not the only amateur radio operator on the island these days. The *International Callbook* lists 12 hams licensed to operate from Pitcairn. Seven of those operators live on Pitcairn. (See sidebar listing Pitcairn's hams.) The other five were, generally, on the island only occasionally, usually briefly, as special guests, usually on DXpeditions—special trips to operate from distant locations.





Left: Tom Christian operating the government radio station on Pitcairn. (Photo by Spencer Murray, Bounty Sagas.)

Above: This replica of **HMS Bounty** *was built for the 1980s film with Mel Gibson. (Photo courtesy of Bounty Sagas, photographer unknown.)*

Listening For Pitcairn

One place to hear amateur radio transmissions from Pitcairn is around the midband of ham frequencies on 15 meters (21,200 - 21,450 kHz) and 20 meters (14,150 - 14,350) on Tuesdays, Thursdays, and Fridays at 0000 UTC (Universal Coordinated Time)—1900 EST (Eastern Standard Time); 1800 CST (Central Standard Time); 1700 MST (Mountain Standard Time); and 1600 PST (Pacific Standard Time). Those frequencies are for voice transmissions; Pitcairn operators seldom operate CW (code).

To hear Pitcairn's official radio station, tune to 2,182 kHz, where every morning Pitcairn announces it is listening for any possible commercial messages. But times vary, and the call is usually quite brief.

As this is being written (fall 1996) propagation—the travelling of radio signals through space—is very poor. Thus it is quite difficult to hear stations from distant locations. But Pitcairn was heard during the 1996 summer in California, at least, and your chances of hearing the island operators are expected to increase significantly in the coming months as propagation improves.

Early Days of Pitcairn's Radio

Communications from Pitcairn began in 1921, when the master of the New Zealand ship *Rimutaka* gave Fred Christian, then Magistrate for Pitcairn Island, a card showing Morse code. Islanders practiced the code, using a flashlight, and finally developed enough skill to signal passing ships. That milestone caught the attention of the Marconi Company, which, in 1922, sent to the island a small crystal receiver with dry batteries.

However, no instructions were sent with the gear and the islanders did not know how to ground it. Eventually the radio operator from another New Zealand ship, the *Remeura*, visited the island and quickly solved the problem. Some time later, the islanders made their first radio contact with a ship, the *Corinthic*.

The Islanders

Tom Christian, VR6TC, has been the island's commercial radio operator and a very active ham for many years. He's 6 ft. 2 in. tall, handsome, well-tanned, trim, quiet-spoken—a young-looking gentleman in his fifties. He greets people with a firm yet soft handshake.

A few years ago I met Tom when he was making a tour of the United States. He told me, "I enjoy living on Pitcairn. I also like getting off-island now and then to see what's going on in other places. But I always look forward to returning to our island."

Tom's wife, Betty, VR6YL, is also on the air often. Despite the remoteness of their lives, they face many of the same experiences as most of us. Betty told me, "While I'm having a great time here in the United States, I am looking forward to getting home—I must finish the plans for the wedding, soon, of one of our daughters."

On Pitcairn, Tom and the some 50 other current residents visit such intriguingly-named places as Hill of Difficulty, Bang on Iron, Goat House, Down Under Johnnie Fall, No Guts Captain, and Where Minnie Off. According to Roy P. Clark, an outsider who moved onto the island in 1909, author of many articles about Pitcairn, such unusual names are "a sort of living record of past happenings."

The Origins

The story of how Pitcairn was settled is of course well-known. In 1790 the island was selected by wandering mutineers to be their home. They were aboard the *HMS Bounty* as it sailed from England to Tahiti. Their mission: to barter for breadfruit trees, then deliver the trees to British colonies in the West Indies, to provide food for slaves.

Their ship was a 100 foot, three-masted, armed merchantship. Their captain, William Bligh, reportedly "was an unusually harsh leader . . . overbearing and tyrannical." In April, 1787, Fletcher Christian, the master's mate, organized a mutiny. Reportedly he stated, "I've been in hell for this fortnight past, and am determined to bear it no longer!"

Christian and the mutineers forced Captain Bligh and 18 of his loyal crew into the ship's small, open boat. It was set adrift.

But Bligh was a skilled seaman. With few provisions and without a chart, he sailed that tiny boat 3,600 miles to Timor, Java. During that two month voyage he charted part of the northeast coast of New Holland—now known as Australia.

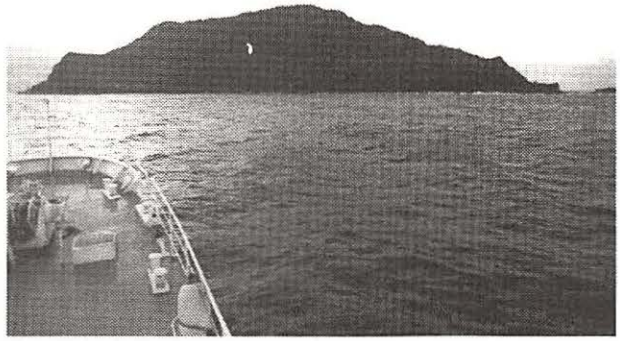
Eventually he returned to England and later commanded other ships with distinction in at least two battles. In 1805 he was appointed governor of New South Wales, Australia. There he was again accused of being a cruel leader and again endured a mutiny—his deputy arrested him and threw him in jail. Later, Bligh was returned to England as a prisoner. He was cleared of charges, promoted to Rear Admiral and then to the still higher rank of Vice Admiral.

In the meantime, the rebels sailed the *Bounty* back to Tahiti to continue the fabulous partying they'd started there earlier. Soon they realized that mutineers were looked upon as unwanted folks, and that British warships might well be coming to capture them. So they got the *Bounty* underway, searched for

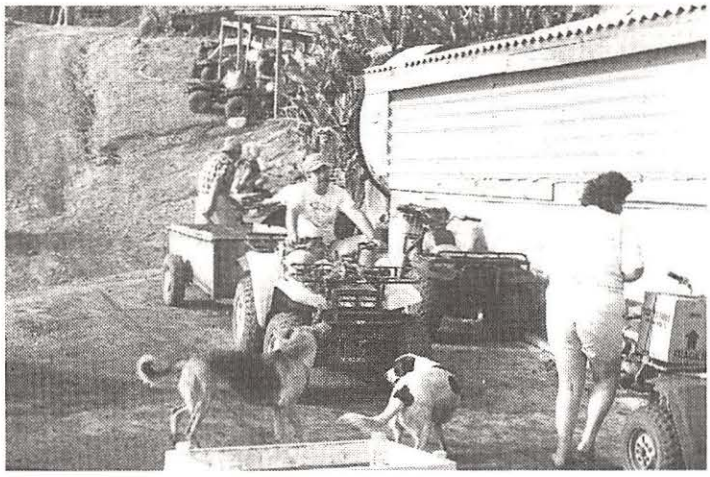
Pitcairn Hams

Listed below are the amateur radio operators reported as now operating from the island. The other hams listed in some sources generally have been on Pitcairn for only brief visits as special guests, usually on DXpeditions (excursions to operate from distant locations). Island operators do QSL (confirm by mail) reception reports from shortwave listeners.

Call	Name	QSL Route
VR6DR		Dennis Christian Via NZ9E, David Miller, 7462 Lawler Ave., Niles, IL 60648
VR6ID	Irma Christian	Via NZ9E, address as above
VR6MW	Meralda Warren	POB 27, Pitcairn Island
VR6TC	Tom Christian	Via W6HS, Charles M. Moser, 10861 Lansdon Ave., Mission Hills, CA 91345
VR6YL	Betty Christian	Via W6HS, address as above



As the **Bounty's** *mutineers approached Pitcairn, it was a view such as this—a small, remote, difficult to access island—that led them to decide to make it their home. (Photo courtesy of Pitcairn Islands Study Center, Pacific Union College, Angwin, CA; copyrighted by Dennis Fahringer 1991.)*



The labor of moving supplies from the Pitcairn landing up several hundred feet to the residential area has been eased now that there are several all-terrain vehicles ashore, delivered by air-drop from helicopters. (Photo courtesy of Pitcairn Islands Study Center, copyrighted by Dennis Fahringer 1991.

an island that might be a safe hideout. Aboard were 28 souls—nine mutineers, six Tahitian men, 12 Tahitian women, and an infant girl.

They wandered for two months, finally selected Pitcairn Island—one of the worse spots in the South Pacific for such an escapade. It's only about two miles long, one mile wide. It covers approximately 1,120 acres—less territory than the Rock of Gibraltar. According to a government booklet about Pitcairn, the mutineers chose that island "almost in desperation."

Twenty-three years earlier English Captain Phillip Carteret, in command of *HMS Swallow*, sailed close to Pitcairn, but didn't land. He wrote in his ship's log, "The surf broke upon (the island) with great violence."

Despite that hazard and the severe limitations of the island which the mutineers must have been able to see from their ship, they struggled ashore at the only possible access to the island—a boulder-strewn cove pounded with heavy seas almost continually. The rest of the island is rimmed with cliffs 300 feet high.

Myths

There is no picturesque sandy beach such as the one Marlon Brando was shown dying on in the 1962 film, *Mutiny on the Bounty*. Many historians agree that the real Tom Christian was shot to death in a field of yams by oppressed Tahitian men. But the America Online version of the *Concise Columbia Electronic Encyclopedia* says, "It is likely that (Christian) managed to return to England, where he was reportedly seen on several occasions after 1808."

Indeed, there are many errors in that Brando film, and in the 1935 version staring Clark Gable and Charles Laughton, and the 1984 remake. Nevertheless, many of today's residents of Pitcairn, according to Ian M. Ball's *Pitcairn: Children of Mutiny*, "accept (those faulty films) as gospel."

Pitcairn Stamps Honor Hams

Many radio enthusiasts—philatelists or not—were interested in the announcement by the Pitcairn Island Postal Administration that on September 4, 1996, it would issue a series of special stamps honoring the role of amateur radio operators in the betterment of the island.

There were to be four new stamps—one at 20 cents, one for $2.50, and a two-part $1.50 stamp for $3.00.

To order the special amateur radio stamps, or for more information, contact:

The Office of the Government of Pitcairn
Postal Administration
British Consulate-General
Private Bag 92014
Auckland, New Zealand

The Pitcairn Island amateur radio station of VR6MW, Meralda Warren, being operated by VR6ID, Irma Christian, photographed by Mavis Warren, mother of Meralda. (Photo by Mavis Warren, Pitcairn Islander.)

Amenities

To get on and off the island, the settlers built distinctive 36 foot longboats. Oars were used to guide the boats as they set to sea; then sail was raised. Today, the boats have motors, but oars are still needed to control the boats through the fierce cross-currents and rough passage. To make boat-handling easier and safer, the British Navy built a concrete jetty for the islanders in the mid 1970s.

There is no airfield. Building one has been discussed for decades, but has been judged to be too costly and quite difficult.

Occasionally helicopters based on military ships drop supplies, but most incoming stores are laboriously ferried by the islanders working their long boats alongside passing ships. And many supply ships simply throw deliveries overboard, leaving them to drift ashore.

There is no TV on the island, but the residents have a fair collection of videotapes and gear to play them on. There are no roads as such, no cars, but a few off-road vehicles. Electricity is provided by a generator that is run a few hours a day.

Achievements

In 1838 the Pitcairners wrote their own constitution; it seems to be the first in history to give women equal vote with men.

Until 1926, letters from the island were sent out with this notice on the envelopes: "Posted on Pitcairn Island: no stamps available." The letters were delivered throughout the world without charge.

But in 1940, the islanders realized that by issuing their own stamps they could make money. Soon stamp collectors around the world placed high values on stamps from Pitcairn.

The population of the island peaked in 1937 at 223 residents. Today, the number is about 50. As an article in *National Geographic* pointed out, "If only a few more (residents) leave Pitcairn, it may not be possible to man the longboats and make contract with the few passing ships."

Long ago Pitcairn islanders established the tradition of singing their own farewell song to visitors leaving the island. The residents consider their singing of that song to be one of the highest honors they can bestow. The late actor and author Sterling Hayden said, "When you hear the Pitcairners sing their good-bye song, everyone cries." The final lines of the song:

"Thanks for your love and constant care,
And kindness that we kindly share.
We part but hope to meet again—
Goodbye, goodbye, goodbye."

Note on advertisement below: *As of 4/26/95 it became unlawful to market cellular-capable receivers in the US. Atlantic Ham Radio assures us that it will give a full refund and hold customers harmless from shipping expenses if a purchased unit is returned to the vendor by US Customs.*

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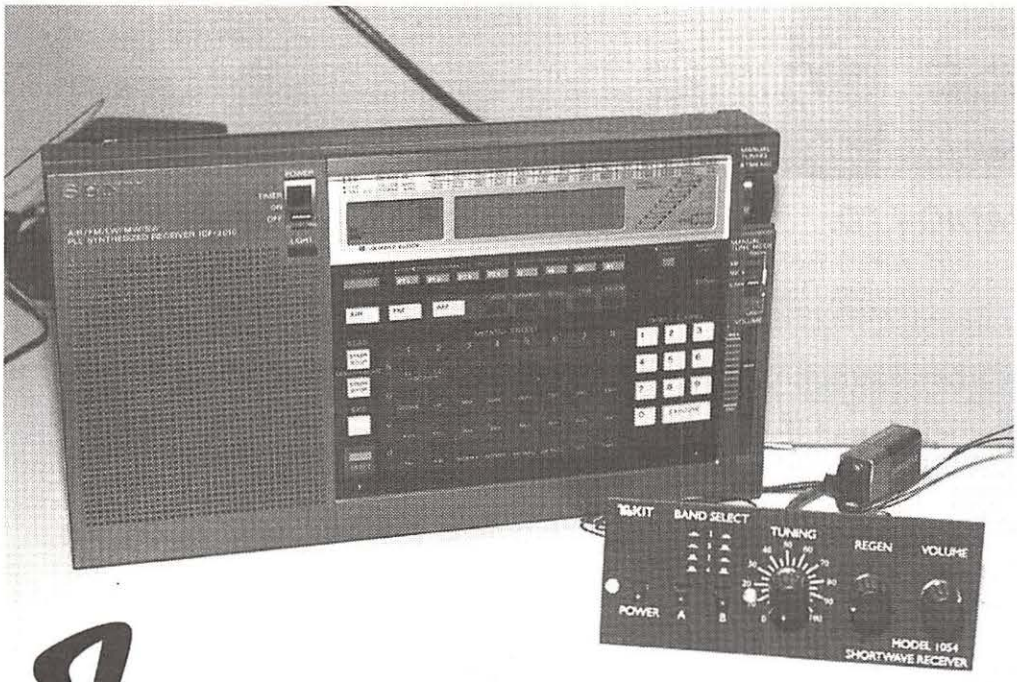
How To Build a Radio from a Kit

A Guide for the Complete ~~Idiot~~ Beginner

By Jeffrey M. Poulin, KF4JSV



The old and the new. The little regenerative receiver represents early 1920's technology, while the Sony 2010 came along 60 years later. Is the modern receiver more powerful, more versatile, and easier to use? You bet! Is the "genny" more fun? That's for you to decide.

I wanted to build a shortwave radio.

To me, radio is a bit magical. A few thousandths of a volt, that began its journey as a radio signal half a world away, touches a simple length of wire. The circuitry turns these electric whispers into music and news and conversation. My Sony 2010 receiver does a great job of this, but it only lets me experience that magic. I figured that using a receiver I built would make me part of the magic.

This article will explain the process I followed, and the problems I overcame, on the way to a functioning SW radio. I hope it will encourage others to give kit building a try. It is fun, educational, and has added to my enjoyment of our radio hobby.

Uh-Oh, Soldering!

There were a few minor obstacles standing in my way. These included a total lack of knowledge, mechanical skill, and self-confidence. The process of building the kit took care of these problems. But then there was the Big One: soldering.

My few attempts to solder were, to be kind, less than successful, but they were educational. I learned the following:

Solder is not some inanimate object. It is intelligent, malicious, and has a nasty sense of humor.

Solder will not flow where you want it to go. No matter how you tilt the piece or what angle you use, the solder will flow away from the joint or just vaporize. If necessary, it will flow straight up to confound your efforts.

It is possible to create a solder bridge you can drive a tank across.

My soldering iron seemed to have only two settings: too cold and thermonuclear disruption.

Despite these obstacles, desire overcame reality and I decided to try anyway. What I learned in the process will enable anyone to build a simple kit.

What To Build

After some research (my thanks to Doug DeMaw and the straightforward descriptions in his books) I decided to try a regenerative receiver kit.

Regenerative radios go back to the 1920s and were the next step after crystal sets. Their advantage was to permit the listener to hear weaker or more distant signals than the crystal sets allowed. Although the technology quickly jumped to the superheterodyne radio (which, in refined form, is what we use today) regeneration continued to be a mainstay of kit building for decades.

A regenerative receiver takes the radio signal, which can be very weak, and repeatedly feeds it back through an amplifier circuit. This can increase the signal strength hundreds of times. The regeneration control determines the extent to which the signal is strengthened and keeps the signal from becoming too strong for the components to handle. This process allows a relatively simple, inexpensive radio to detect more than only strong local stations.

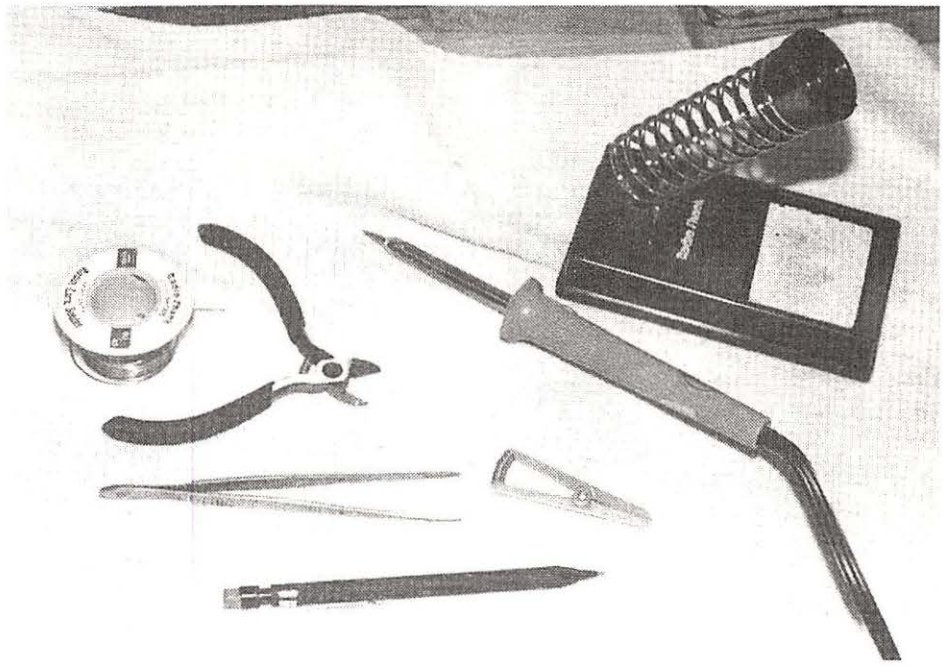
The "Genny" met my own criteria of simplicity and lack of expense. It also requires a hands-on approach to tuning in stations and I wanted to try that. Several manufacturers offer such kits. I ordered the Ten-Tec model 1054, 4-band shortwave receiver from their T-Kit division. I was willing to risk $24.95 on this venture.

Preparation

While waiting for the kit to arrive I tackled that soldering bogeyman. The written instructions I've come across simply don't work for former English majors. I could proofread the directions but not translate them into action. Finally, I talked to some older members of my ham radio club. This was how I learned about the best wattage for the iron, the type and size of solder to use, timing, and how to hold the iron tip and solder to get the proper flow.

After a brief demonstration I practiced soldering some lengths of bell wire. In half an hour I was getting good mechanical and electrical connections. Twist the wires together, hold the tip of the iron (actually a 30 watt soldering pencil) against the point where the wires joined for about 3 seconds and apply the solder to the joint directly opposite the tip.

Holy cow, it worked! I repeated the process a dozen times to be sure the first try wasn't a cosmic case of beginner's luck. It worked every time. A few questions, a brief demonstration and a little practice was all it took to get past that fear of soldering.



My state-of-the-art tool kit: solder, soldering iron and holder, diagonal cutters, tweezers, and a pencil. Tapping joints with the eraser helped me find bad solder connections.

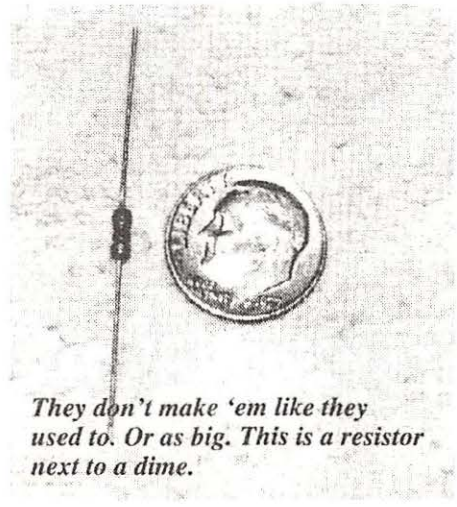
Organization

Finally, the kit arrived. It consisted of a couple of bags of parts, a circuit board, a front plate with control markings and the instructions. This is a pretty basic kit. It doesn't have a case. But now that I have it working, I'm going to build a cabinet for it out of some nice walnut stock I've been saving.

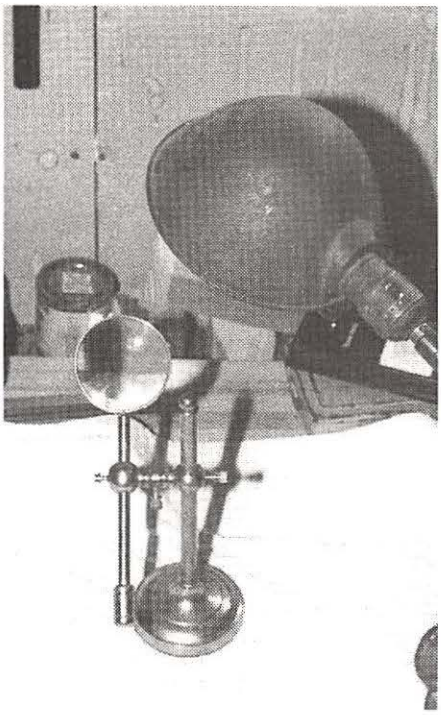
The instruction booklet Ten-Tec provides is well written and organized. It takes the kit builder through the bands they'll hear and what is on them, the advantages and limitations of regenerative receivers, parts list, test procedures, use, troubleshooting, and a glossary. That's a lot of information in 28 pages.

I've written a number of computer user guides over the years and I have learned that no instruction manual is so basic and comprehensive that it will cover all the possible questions, but this one comes close.

The next step was to make sure all the needed parts were included. They were. But I had a bit of a shock. The only time I had handled a resistor was in a high school class, during the last ice age. It was a nice, fat cylinder with broad color bands showing the value. The modern equivalent is a tiny thing I picked up with tweezers. The instructions always provided the color bands for each resistor, but I had to use a strong direct light and a magnifying glass to clearly distinguish



They don't make 'em like they used to. Or as big. This is a resistor next to a dime.



A goose neck lamp and a magnifying glass made it easier to read component values.

Even young eyes will benefit from a magnifier. It also helps to differentiate between the color of the bands.

the markings.

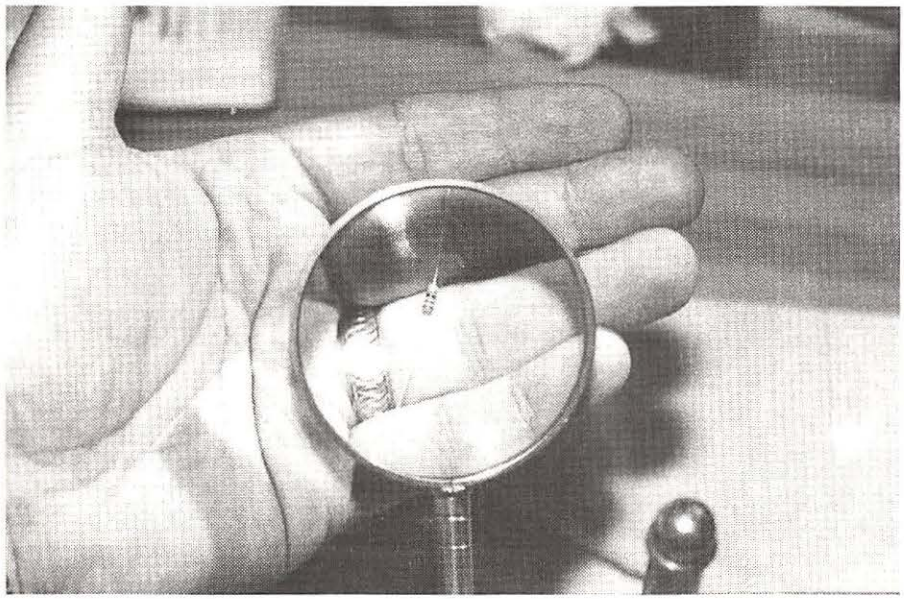
When you lay out the parts and check them against the parts list, put the components on a towel to keep them from rolling off the bench. I started this after learning that the smallest, most vital parts will try to escape their fate. When you aren't looking, they fall to the floor and hide in the darkest, hardest to reach area, preferably under something heavy. For me, it was a bookcase with several hundred pounds of books. The towel prevented The Great Escape.

Construction

Oddly enough, the actual construction was the easiest part of the project. It was time consuming but not difficult. The circuit board is silk-screened, providing the part number and outline for each component. It even indicates the polarity for the items where that matters. This really takes the guess work out of it. I simply followed the instructions which tell you when and where to place each part, one part at a time.

My routine was to double check the component value, insert the wires through the circuit board holes, clamp a heat sink on the leads (this absorbs the heat of the iron and keeps it from damaging the components) and solder the part in place. My pace was glacial and would make an experienced kit builder grind his teeth with impatience if he were foolish enough to watch. However, I was more concerned with doing it right than doing it fast. And I did get faster as I went along.

The circuit board is crowded. To avoid confusion, I would snip the component leads with diagonal cutters or nippers after the solder had cooled. Otherwise, when the board is turned over it can be difficult to see the leads to be soldered for the little forest of wires.



Part way through the construction the instructions suggest testing the amplifier section. When I didn't get the specified results, I called the technical support number listed in the manual. The staff person had me check certain components and connections. Shortly, he narrowed it down to a cold solder joint which didn't provide a good electrical connection. A minute with the soldering iron corrected the problem. The technical support people were great. They probably have solder in their veins and Ohm's Law imprinted on their DNA, but they were able to walk this rank beginner through problems without making me feel like an idiot. Their approach was helpful and encouraging.

The only other problems were a few more cold solder joints that I found by tapping the connection with the eraser end of a pencil. So much for high science.

Actual construction took about seven hours. Anyone with some experience could cut that time almost in half.

What You Can Hear

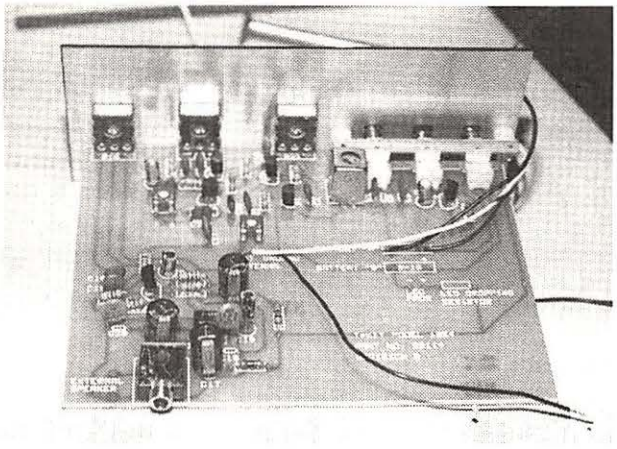
I couldn't wait. I attached an odd length of insulated bell wire, maybe 15 feet, to the antenna lead with an alligator clip, connected batteries and plugged in the headset. Holy Moley, I was listening to a broadcast in French on a radio I had built myself. YEE-HAW!

That first station turned out to be Radio Canada. In short order I heard Deutsche Welle, BBC, Radio France, Radio Moscow, several U.S. stations, and something in Arabic. Over the course of a week I listened to more than a dozen other shortwave stations, several ham SSB (single side band) conversations, and CW (Morse code) transmissions.

The 1054 kit is a four band model. Band 1, 5.90 to 6.4 MHz, provides plenty of shortwave programs on 49 meters. Band 2, 6.9 to 7.4 MHz, is especially good in the evening for European shortwave broadcasts and 40 meter ham signals. Band 3, 8.5 to 10.2 MHz, gives you the 31 meter broadcast band and 30 meter ham band. Band 4, 11.5 to 16.5 MHz, is especially good for 20 meter ham signals.

Although you can receive transmissions at any time, I've found that evening is the best. Just turn the regeneration control most of the way down (counter-clockwise) and tune through each of the four bands. One station after another will come through.

Part of the fun with this little receiver is the degree of control you must exercise in tuning. Choose a band, set the regeneration control mid way or lower and s-l-o-o-o-o-w-l-y tune through



Above: This is the completed circuit board. These few components will let you hear shortwave signals from Germany or Morse code from the next state.

Right: The front panel of the kit provides the basic markings needed to tune the radio. The rest is by feel and practice.

the frequencies. When something comes through, use the regeneration control for fine tuning. It takes a bit of practice and patience, but soon you'll be able to adjust the knobs with precision.

Conclusion

Assembling this simple receiver was a lot of fun. I not only built a radio, I built confidence and further interest in the hobby. I can't help but wonder about my career path if I had done this as a teenager instead of in my mid-forties.

One unexpected benefit was the reaction from older hams I talked to. They were delighted that someone new to the hobby would try to build their own gear. It tapped a deep well of memories and experiences that they shared with me. It gave me a better appreciation of radio and taught me a lot.

A final thought. Since this kit can be built by ***anyone*** (I am living proof) it would make a wonderful project to share with your children or grandchildren. In an era of modems, computer games and the Internet, this is a hands-on experience that can teach youngsters the basics of electronic communications and radio history. Who knows? Perhaps you'll be starting them on the path of a 21st century electrical engineer. If you start looking for them, you'll find kits available for a wide variety of products from a number of manufacturers and *MT* advertisers.

T-Kit is a division of Ten-Tec, Inc. They offer many other kits in addition to their well-known HF transceivers. Contact them at 1185 Dolly Parton Parkway, Sevierville, TN, 37862-3710. For orders or information call them at 1-423-453-7172 or fax them at 1-423-428-4483.

Dan Veeneman
dan@decode.com

PCS à la Mode

Capacity is a concern in any wireless communications system. High demand for cellular service, especially in large urban markets, has created a need to serve a greater number of users in a limited amount of frequency space. Cellular system operators are looking for new ways to fit more users into their increasingly crowded network, and many are choosing to move from the existing analog transmission technology to one of the competing digital standards. These standards are also being selected by the new PCS providers as they begin to build out their own networks. Although digital systems provide a variety of benefits, this month we'll focus on two main digital access methods and their effect on system capacity.

Almost all current and proposed digital standards are based on either Time Division Multiple Access (TDMA) or Code Division Multiple Access (CDMA). These two methods are fundamentally different and incompatible with each other, but each claim to able to support anywhere from three to twenty times the number of simultaneous callers than the current AMPS cellular standard, which uses Frequency Division Multiple Access (FDMA).

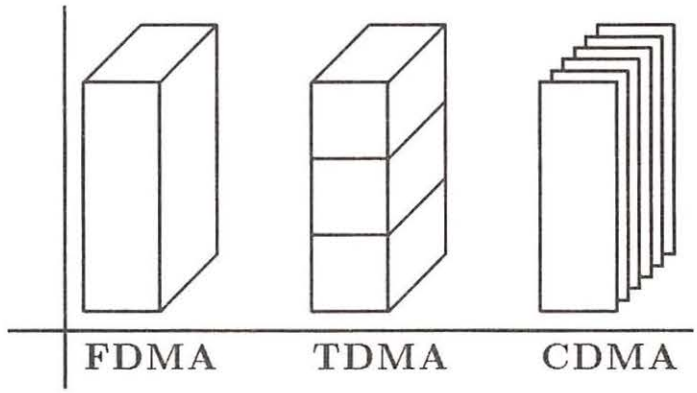
Frequency Division Multiple Access

FDMA is a common method of allocating bandwidth. A band of frequencies is divided up into channels, each of a particular size. A transmitter in an FDMA system is given exclusive use of one or more channels. This is how broadcast radio and television are set up—each "owns" a portion of the frequency spectrum that is set aside just for them.

This is also true of cellular systems, where a base station is allowed to transmit on a set of forward channels (see the November column for details) and a mobile unit transmits on one of a set of reverse channels. No other base station within range of the mobile will be transmitting on the same forward channel, and no other mobile within range of the base station should be transmitting on the same reverse channel. Both the base and the mobile usually transmit continuously during a conversation, and fully occupy their assigned forward and reverse channels. No other conversation can take place on these channels until the first conversation is completed (or the call is handed off to another base station).

Time Division Multiple Access

TDMA is a more efficient, but more complicated way of using FDMA channels. In a TDMA system each channel is split up into time segments, and a transmitter is given exclusive use of one or more channels only during a particular time period. For example, in North American TDMA (also known as Interim Standard 54) each channel is essentially divided into three time slots. A maximum of three transmitters take turns sending in their assigned time slots. A conversation, then, takes place during the time slots to which each transmitter (base and mobile) is assigned. TDMA requires a master time reference to synchronize all transmitters and receivers.



TDMA was the first digital standard to be proposed, and is attractive to current cellular operators because it allows existing analog customers to continue using the network as digital capability is added. Under IS-54, channel bandwidth remains 30 kHz and the data format on the control channels remains identical to those under AMPS. Voice channels are designated as either analog or digital, and analog cell phones continue to operate as they do under AMPS since they will always be assigned to analog voice channels. Dual-mode and digital-only phones are assigned digital voice channels where they are available. Operators may convert base stations to digital capability as demand and funding allow.

Code Division Multiple Access

CDMA is fundamentally different than TDMA and FDMA. Where FDMA and TDMA transmit a strong signal in a narrow frequency band, CDMA transmits a relatively weak signal across a wide frequency band. Using a technique called direct sequence spread spectrum, the data to be transmitted are combined with a pseudo-noise code (a predetermined binary sequence that appears random) and transmitted broadband. CDMA under Interim Standard 95 uses a bandwidth of 1.25 MHz, or more than 40 times the 30 kHz channels of AMPS and TDMA.

The pseudo-noise code (PN code) is a series of binary "chips" that are much shorter in duration than the data bits. Since the chips appear to be in a random pattern, and there are many chips per data bit (in IS-95 there are 128 chips for each data bit), the modulated result appears to normal (FDMA) receivers as background noise. A spread spectrum receiver using the same PN code as the transmitter will correlate, or match up, the wide band signal with the chip sequence and despread the signal, recovering the data. A spread spectrum receiver with a different PN code will not be able to recover that signal, and if the PN codes were chosen correctly, will hear nothing but noise.

This relative immunity to interference, whether from outside sources or other spread spectrum transmitters, gives CDMA systems the ability to pack many users into the same frequency space at the same time. It also gives a measure of security to each signal, since each

user will have a different PN code. CDMA also does not require different base station radios for each user—the same radio may serve multiple users with just a change in PN code.

There is a limit to CDMA capacity, however, and it is essentially the amount of interference a CDMA receiver can tolerate. As more and more units transmit, the amount of noise a receiver sees goes up, since all signals not using the receiver's specific PN code appear as noise. At some point there is so much noise that the receiver can no longer hear the transmitter. Boosting the transmitter power won't help overall, since it increases the noise for all the other receivers, who would in turn tell their transmitters to boost power, and the situation remains.

A similar real-world issue CDMA has to face is known as the near-far problem. In a nutshell, if a unit near a base station is transmitting with too much power, signals from units far away from the base station will be lost in the noise. CDMA system designers believe they have this problem solved by rapidly adjusting the amount of power each unit is using to transmit. This already occurs to some degree in AMPS systems, where the base station commands far away units to use more power and near units to use less power. This process must occur very quickly in CDMA systems, and it remains to be seen whether it can be made to work reliably outside of the laboratory.

And now, an Analogy

It may be easier to visualize the differences between all these methods by imagining a cocktail party where two people wish to converse with each other. With FDMA, everyone in the room must be silent except for the speaker. The speaker may talk as long as they wish, and when they finish someone else may start speaking, but again only one at a time. New speakers must wait (or find another party) for the current speaker to finish before starting.

Everyone in the room can hear and understand the speaker, unless they are too far away or the speaker's voice is too soft. If the intended listener is close enough, the speaker may decide to whisper. Conversely, if the listener is too far away, the speaker may have to shout. Since no one else should be talking, this presents no problem. If someone talks out of turn, the listener will probably be confused and not be able to understand either speaker.

In TDMA, everyone in the room agrees to watch a clock on the wall, and speak only during a particular time. Each person wishing to talk is given a set period of time, and each person listening must know what that time period will be. For example, everyone may agree on time slots with a duration of ten seconds. Speaker number one may talk for ten seconds starting from the top of the minute. The listener who wishes to hear this speaker must also be aware of the schedule, and be ready to listen at the top of the minute. Speaker number two may speak only from ten seconds after the minute until twenty seconds after, and so on.

As with FDMA, only one person at a time may speak, but each speaker's time is now limited and many persons may take their turn. If someone in the room cannot see the clock, they will not be able to speak and will have great difficulty understanding the speakers.

In CDMA, the speaker and the listener have agreed beforehand to use a language that no one else at the party understands. Many speakers may talk at a CDMA party, each using a different language, and it is relatively easy for the listener to hear and understand the speaker as long as there aren't too many speakers talking at the same time. As more and more speakers start talking, the noise level in the room goes up and it becomes harder and harder for the listener to tune out the other speakers and make sense of what their speaker is saying. If a speaker begins to shout, in order for their listener to hear better, it raises the noise level even more and makes it more difficult for everyone else in the room.

Which is Better?

The question of which digital access method is better has been debated for years, and will continue to be the source of much disagreement. It is often difficult to sort fact from opinion, since many sources of information come from manufacturers who have a vested financial interest in the success of one standard over another.

TDMA systems, of which GSM is one, are in place and operating and have been successful for many years. CDMA systems have provided the military with secure, jam-resistant communications for decades, but have yet to prove themselves capable of delivering the promised capacity increases in a commercial environment. Both sides claim to provide better voice quality and lower cost of service than the other. As with many questions involving the fast-paced world of communications, keeping informed and knowing the underlying principles will help sort things out.

Speaking of keeping informed, if you have access to the World Wide Web, be sure to check out the *PCS Front Line* web pages at **http://www.grove.net/~dan**. You'll find information about cellular and PCS systems, including frequency allocations, channel assignments, and details that didn't make it into this column.

As always, electronic mail is welcome at *dan@decode.com*. Until next month, happy monitoring!

Cellular Standards

	AMPS	N-AMPS	D-AMPS	GSM	CDMA
Standard	IS-91	IS-88	IS-54	GSM	IS-95
Channel Size	30 kHz	10 kHz	30 kHz	200 kHz	1.25 MHz
Total Channels	832	2412	832	124	—
Timeslots	—	—	3	8	—
Voice Channels	Analog FDMA	Analog FDMA	Both TDMA	Digital TDMA	Digital CDMA
Control Channels	FDMA	FDMA	FDMA	TDMA	CDMA
Capacity vs. AMPS	1	3	3	1.5	6 - 20

AMPS Advanced Mobile Phone System
N-AMPS Narrowband AMPS
D-AMPS Digital AMPS
GSM Global System for Mobiles

Richard Barnett
ScanMaster@aol.com, Compuserve at 102354,3643

Trunking Scanners Set to Debut

It's the biggest news in the scanner industry since the introduction of the first programmable radio: The Uniden TrunkTracker has debuted at the Consumer Electronics Show (CES) in Las Vegas, Nevada.

CES is the most important trade show of the year for anyone involved in buying or selling mobile and home electronics. It's where such hits as VCRs were first demonstrated and Uniden is hoping that retailers, mail order cataloguers, and anyone else interested in selling high-tech electronics will see and appreciate their trunktracking accomplishment.

The first Uniden trunktracking scanner is the Bearcat BC-235XLT handheld. The scanner will track all types of Motorola analog trunking, which is to be used by the majority of public safety trunking systems. The radio will not track Ericsson/GE nor Johnson-compatible trunked systems.

The 235 also works as a conventional scanner (this has surprised and delighted many); however, users can either operate in the trunking mode or in the conventional mode, not both together. Also, only one trunked system can be tracked at a time. These minor shortfalls pale in comparison to the remarkable feat of actually tracking trunking radio.

A base model, the BC-895XLT, will follow the 235 some months down the road. We will have a full, cover-story report on the Uniden trunking radios in the next issue of *Monitoring Times*, including details on all operational aspects of this amazing technology. Start saving now, for the fun is finally back in scanning!

The Bus-capade....One More Time

The great bus caper attracted a great deal of reader interest (Sep and Dec '96). Here's one of the many letters we received on the articles, this one from Tom Prevo of Nebraska:

"I always enjoy reading your column in *MT*. But, I'll have to admit that I didn't think that your December 1996 'The Great School Bus Caper' column would have much relevance! I wouldn't have thought having the frequencies for the local school district would be that important, so it wasn't something I was interested in. I couldn't have been more wrong!

"The Thursday, December 12 *Lincoln Journal-Star* edition reported a story that makes me have a change of heart. According to the *Journal Star*, a 14 year old boy by the name of Sam Kotera boarded his school bus at 7:30 a.m., sitting behind the bus driver as it maneuvered through northeast Lincoln. During the final minutes of the route, the kid asked the bus driver if he had ever been hijacked and if he had ever had a knife stuck in his throat.

"As the driver parked the bus at Culler Middle School, a girl on the bus told the driver that Kotera had a knife under his jacket. The other kids got off the bus, but Kotera refused to move.

"Kotera drew a butcher knife from his coat and the driver left the bus and shut the door. Along came the school principal who tried to negotiate with the student, but the kid, along with help from another student who advised him how to release the air brake, drove away.

"Police cruisers across the city searched for the bus, but at that time of day, there are lots of them around that time of morning. Can you imagine trying to find the right bus in a city of 200,000 people?

"The boy's parents came to the school and the father briefly talked with his son on the bus radio (finally, the point of my letter) about 8:30 a.m. The father asked the boy if he could hear him and to say 'yes.' The father told his son that they (his parents) loved him and urged him to park the bus. The boy initially refused to reveal his location. He eventually parked the bus about 12 miles from the school. During the ride, he tossed the knife out the window.

"He was arrested on robbery, use of a weapon to commit a felony, unauthorized use of a motor vehicle, leaving the scene of two property damage accidents (while leaving the lot) and driving without an operator's license.

"So, I suppose I should think about getting those bus frequencies. Who would have expected to hear something as frightening as a hijacking? ... What's this world coming to? Now, you'll have to pass through the metal detector before getting on the bus!"

BearTracker BCT-7 Booster

In a recent column we discussed your all-time favorite scanners. The editor mentioned the Uniden BCT-7, which he helped design, as one of his all-timers. Mr. Harley Bogart of Aurora, Missouri, wrote to us recently, "This (the BCT-7) is the radio you should be pushing!" Mr. Bogart included his frequency list for the 100 open channels (divided by service banks) available in the radio. While this is a very localized list, it does offer a valuable perspective on how to arrange frequencies in your BearTracker. We love how Mr. Bogart mixed in a variety of interests: state, county, and local public safety and city services; railroads, utilities, and business.

Private Bank

(The Private Bank is operated just like a normal scanner. There is no interrupt for checking priority on one of the Highway Patrol extender or special channels.)

1. 155.400 Aurora Hospital
2. 155.775 Aurora Police
3. 155.370 Point-to-point
4. 155.730 All Sheriffs
5. 155.025 Lawrence County
6. 154.220 Aurora Fire
7. 42.060 Highway Patrol - Springfield
8. 42.120 Highway Patrol - Carthage
9. 42.220 Highway Patrol - Car-to-car
10. 47.940 Missouri Gas Energy
11. 48.360 Empire
12. 155.205 School Bus & Cox
13. 155.415 Monett Police
14. 155.310 Barry County
15. 155.340 Hospital
16. 155.655 Stone County
17. 155.475 Mutual Aid
18. 155.865 Mt. Vernon Ambulance
19. 154.755 Greene County
20. 154.815 Cassville Police
21. 154.430 Monett Fire
22. 151.160 Conservation
23. 460.100 Springfield Police #1
24. 460.400 Springfield Police #2
25. 460.625 Springfield Fire

Highway (Patrol) Bank

The Highway bank contains pre-programmed frequencies for highway patrol and state police agencies on a state-by-state basis. The

frequencies below are in addition to the pre-programmed channels.

1. 154.220 Aurora Fire
2. 155.340 Hospitals
3. 155.400 Aurora Hospital
4. 155.205 Buses and Cox
5. 155.865 Mt. Vernon Ambulance
6. 154.430 Monett Fire
7. 151.160 Conservation
8. 153.630 REA
9. 155.955 South Barry County
10. 460.625 Springfield Fire
11. 155.880 Aurora Street Department
12. 155.145 Civil Defense
13. 461.925 Cable TV Maintenance
14. 464.950 A-1 Trash Service
15. 160.920 Burlington Northern (Santa Fe) Railway
16. 47.940 Missouri Gas Energy
17. 48.360 Empire
18. 155.280 Springfield Ambulance
19. 155.325 St. John's Ambulance
20. 415.700 Air Force One
21. 155.055 Lawrence County Sheriff
22. 154.400 Greene County Fire
23. 153.900 Kay Concrete Company
24. 159.915 Marionville Repeater
25. 158.880 Pierce City Repeater

Fire

Common, national, "PF" fire frequencies, "PL" local government frequencies, "PS" and "PM" ambulance frequencies are included in this bank. Ten additional open channels are available for programming.

1. 155.055 Lawrence County
2. 155.370 Point-to-point
3. 155.730 All Sheriff
4. 155.475 Mutual Aid
5. 155.775 Aurora Police
6. 460.100 Springfield Police
7. 42.060 Highway Patrol - Springfield
8. 42.120 Highway Patrol - Joplin
9. 154.755 Greene County
10. 155.655 Stone County

DOT

Department of Transportation frequencies, pre-programmed on a state-by-state basis, are covered in this bank which also contains ten open user-programmable channels. Many people put their own local DPW channels in these ten slots to match-up with their state DOT plan. Here's a unique concept:

1. 46.610 Cordless phones
2. 46.630 " "
3. 46.670 " "
4. 46.710 " "
5. 46.730 " "
6. 46.770 " "
7. 46.830 " "
8. 46.870 " "
9. 46.930 " "
10. 46.970 " "

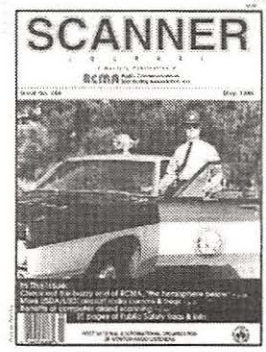
Mr. Harley goes on to say that he has not yet loaded his 25-channel Police Bank nor his 5-channel News Media Bank. "There are so many ways to mix-and-match...!"

A Tale of Two Scanner Mags

It was the best of times; it was the worst of times, in this story of the rise and demise of a couple of scanner hobbyist publications. The following is my understanding after sifting through information and opinions provided by a large number of sources. While I expended a great deal of effort to get the facts straight, readers may have their own interpretations of the events that led up to the current state of affairs and, of course, there is no doubt information to which we were not privy. Space is limited for a continuing discussion, but I would welcome your comments and rebuttals.

The saga really begins back in the late 1960's when the first scanners were produced. Just like other radio hobbies, scanning quickly became the pasttime of many. In 1975 a small group of scanner buffs got together in southern California and started the Radio Communications Monitoring Association (RCMA). While the club newsletter initially focused on southern California monitoring, word of the RCMA spread across the country and membership in the all-volunteer organization quickly grew. Eventually there would be a few thousand subscribers, and satellite clubs, such as CARMA in Chicago, served local regions.

The RCMA was not a slick publication. In the early days, each monthly issue would be graced with the many varied typewriter fonts of the national and regional volunteer editors. Most loved it, some hated it, but everyone respected the fact that knowledgeable volunteers, including Bob Grove, Gene Hughes, and Larry Van Horn, were



contributing to the cause. Scanning was well served by the RCMA's existence.

The RCMA thrived through the 80's and early 90's, but eventually subscribership declined. As John Clark, one of the movers-and-shakers in RCMA related to us, "In my opinion this (demise) started in January 1995 when we started to lose membership. From January '95 to May '96 we lost on average 22-2/3rds members per month. RCMA membership seemed to correlate with which electronic toy was in or out of fashion. Our big growth came with the demise of CB radio, and from then on we went up or down with the VCRs and other toys. It is my opinion the last decline was due to the Internet competing for the discretionary income of possible members."

Whether it was the burgeoning growth of the Internet and the concurrent wide availability of basic frequency data, or the rise in trunking communications, the trend was undeniable.

The RCMA, however, had tried to resurrect itself by offering itself more widely in the marketplace as the *Scanner Journal*. The organization signed up with a magazine distributor, but the lofty ambition of profitable national exposure did not play out as expected. The RCMA and the magazine distributor ended up in a dispute and, by mid-1996, there weren't enough funds for the *Scanner Journal* to continue publication. The senior staff realized that they had put their last issue to bed and that the RCMA was not re-awakening. It was a hard-fought decision on which many in the industry were consulted.

A white knight was sought who might assume responsibility and continue publishing. An alternative was to find an existing publication that would fulfill existing *Journal* subscriptions with its own magazine. After contacting almost everyone of influence in the business, the RCMA felt that an offer from *U.S. Scanner News* was their best option. As Jerry Short, the RCMA President at the time, conveyed, "Our only interest was in seeing that the subscribers were taken care of somehow."

The deal, dated July 29, 1996, and signed shortly thereafter, was structured as follows:

- U.S. Scanner Publications would honor the balance of RCMA's paid subscriptions. (So, if you had three months to go on your RCMA subscription, you would receive three free issues of *U.S. Scanner News*.) RCMA provides U.S. Scanner Publications with their subscription database on disk.
- Any funds left over after paying all debts by RCMA would be turned over to U.S. Scanner Publications.
- U.S. Scanner Publications was not responsible for any RCMA debts.
- RCMA agrees that all rights to their name, logo and format will be owned by U.S. Scanner Publications.

Interestingly, the arrangement was formalized on U.S. Scanner Publications letterhead, with signature lines for RCMA President Jerry Short and editor Carol Ruth, but not for anyone from U.S. Scanner Publications. Besides no money changing hands in the transaction, U.S. Scanner Publications also requested, and took possession of, all available back-issues of RCMA, at no charge other than postage to ship them to Oregon so that they could be eventually sold to their readers.

To many not privy to the details of the agreement, the deal seemed quite reasonable. While there were hobbyists who opposed the move

and who were quite vocal about it on various online nets (another story in itself), it was effectively out of their hands. Most simply accepted and appreciated RCMA's effort to make good.

According to Bob Gehri and others, *USSN* envisioned a separate section within its cover, appearing as RCMA. It was hoped that existing volunteer RCMA writers would continue to supply copy for the magazine at no charge while *USSN* writers would continue to be paid as the funds were available to do so. The idea was to, eventually, consider spinning RCMA back off as its own publication. Gehri did not see any conflict or contradiction in having both volunteer and paid writers under a single cover. The idea, perhaps misunderstood by some, rankled many. The e-mail and online discussion concerning *USSN's* intentions grew even more heated.

U.S. Scanner News itself has had an interesting history. Started by Mr. Gehri (aka R.L. Smith) in 1988, the newsletter folded with the February/March '93 issue. By September of 1994, however, a new, full-color version of *USSN* was on store shelves. Gehri had struck a handshake deal with Ken Gilbert, a Portland radio store owner, to revive his baby.

In the early days of the newly reborn magazine, Gilbert must be commended for expending a great deal of capital, and Gehri, for expending a great deal of editorial time in trying to build a business based on scanning.

Mistakes did happen, however, despite the hard work. Perhaps their most well-publicized error came early on when they printed their first California *Frequency Almanac*. Being a California frequency guide, and including every public safety and business license, it was an enormous publication. The books were pretty much a dump of FCC data, sorted and presented in interesting ways. Somehow, according to editor Bob Gehri, one of their sort fields did not compute correctly, and Los Angeles, along with a good portion of other listings, was left out of the publication! In the end, U.S. Scanner Publications had to print a complementary supplement for California.

The company appeared to get its act together after that debacle, however. *U.S. Scanner News* was applauded for its unbiased reviews of scanners, books, and accessories. Glossy, full-color covers graced each issue and *USSN* began to heavily advertise in the hobbyist trades.

Then *U.S. Scanner's* advertising spending began to drop. By the spring of '96, there were disturbing rumblings from editors who were not being paid promptly, or at all. Respected writer Laura Quarantiello told us, "All of *USSN*'s writers have been without payment for more than 10 months (and some for longer periods). We were not informed of any financial problems; the checks just stopped coming. As a result, myself and several other writers discussed the matter and consequently informed Bob Gehri and Ken Gilbert that, regretfully, we would be unable to continue writing for the magazine if we would not be paid for our work. It was not an easy decision to make. We received a letter from Ken Gilbert in July saying that US Scanner Publications 'has been in a cash crunch' and could not afford to pay writers. The letter also stated that *USSN* was keeping records of what was owed and has 'every intention of paying in full. This will likely occur later this year.'"

Some of *USSN*'s writers assumed they were to be replaced entirely by volunteer RCMA writers. While Bob Gehri disputes this assertion, as of this writing, Laura Quarantiello had received no payments for her work since last spring. (Note: Gehri claims that he was paid as an independent consultant for *USSN* and had no knowledge of the financial state of the company.)

By mid-summer, at about the time Laura Q. and others received the letter from *USSN*, Bob Gehri and Ken Gilbert themselves mutually agreed that they could no longer work together. Yet, the RCMA deal had just been finalized and *U.S. Scanner News* took possession of a very valuable mailing list, logo, and name at no cost other than the expressed intention to make good on outstanding RCMA subscriptions.

This editor was due to receive some of those freebie *U.S. Scanner* issues. None ever showed up. A combined September/October *USSN* was mailed, with Bob Gehri's name missing from the magazine's masthead. A note inside the issue told subscribers of the RCMA arrangement, and promised that the double-issue was an anomaly and that they would receive a make-up extra issue at the end of their subscriptions. As of this writing in mid-December, no November or December issue has been received by anyone we know.

In late November, calls to *USSN*'s toll-free and local lines were ringing busy day and night. By December 10th, calls to the same lines were answered with the automatic message that the lines were either disconnected or no longer in service. The *USSN* Web Site had not been updated since early summer. Gehri, for his part, is remorseful that he put himself, and the subscribers, in this position. Attempts to reach Mr. Gilbert by e-mail, phone, and through intermediaries, has met with no response.

The apparent demise of *U.S. Scanner News* is sad, and its end is assuredly based in part on the state of the hobby. However, since *USSN* evidently folded without a known public word from anyone at the Oregon-based publication only a few months after the RCMA agreement, hobbyists are left with several unanswered questions:

- Did *U.S. Scanner News* have any idea that they would have trouble fulfilling their obligation?
- To what extent did the overseers of RCMA investigate *U.S. Scanner's* financial state before making the agreement? Did they know about *USSN's* fragile state?
- Was consideration given to putting a remedy in place in case *USSN* was unable to fulfill its obligation to continue subscriptions, such as a return of all RCMA rights?
- Who now owns, and what will happen to, the RCMA mailing list (which loses value with every passing day), logo, and name?

The USSN/RCMA situation is a black mark for our hobby that came at exactly the wrong time. Yet, scanning may be on the cusp of a turnaround. Trunking scanners are about to debut. Relm (former Regency), AOR, and ICOM are premiering new products, too. Here's hoping that this sad story represents the bottoming-out of the hobby and that 1997 dawns with the reversal of fortune we've all been awaiting.

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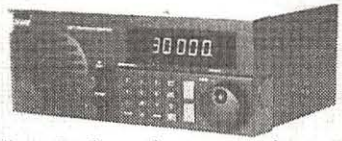

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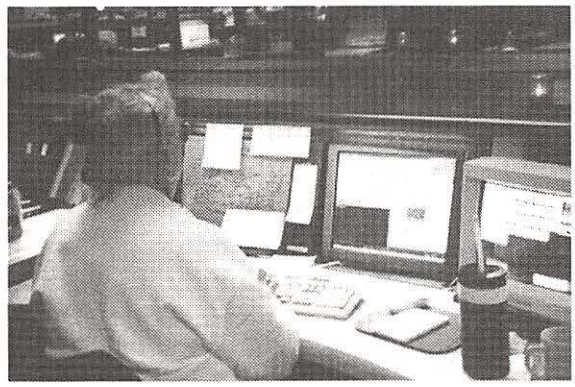
Airline Company HF Frequencies

HF airlines company frequencies are fun and interesting to monitor. You will get a fascinating insight into the airline operations and a behind the scenes look at what is really happening on the flight decks of international airliners.

The ground stations that are associated with the frequencies are called LDOC or Long Distance Operational Control stations. There are two types of LDOCs: those run by the airline operations staff and the common carrier.

The International Telecommunications Union (ITU) has authorized some frequencies in the routed aeronautical mobiles bands for air-to-ground company LDOC communications. These frequencies are often shared by more than one international air carrier and some carriers even provide services for other air carriers on these frequencies.



Similar to the Delta Communications Center pictured here, airlines use their own network or a common carrier for international flights. Photo by Rachel Baughn.

Traffic typically consists of arrival/departure information, passenger/fuel loads, flight progress reports, aircraft maintenance problems, and crew scheduling.

Information passed on LDOC frequencies can vary, and while most of the messages may appear to be routine in nature there are times where the conversations can become quite colorful.

The most important thing to remember when monitoring LDOC communications is that with one exception—South African Airways (their flights report to Johannesburg on the hour)—there are no transmission schedules. Unlike the air traffic control frequencies where aircraft report their positions at the specific times, company messages can occur at any time.

One of the most widely used methods for exchanging company traffic is by way of phone patches with the common carriers. Common carrier (i.e. ARINC, Portishead Radio, Stockholm Radio, Universal Radio, etc.) provide services to a large number of airlines, biz jets, cargo carriers, and private aircraft. Common carriers are able at the pilot's request to provide a phone patch to the company dispatching office. This allows the pilot to report and receive any information.

The vast majority of the traffic you will hear on LDOC channels is in English. Some airlines do, however, communicate in their native language on company frequencies. These broadcasts are far more interesting than the routine traffic you will monitor on the MWARA (Major World Air Route Areas) air traffic control channels.

Whether the messages are routine or not, Long Distance Operational Control frequencies can make for some very interesting listening.

Sydney Aero Gone

One of our *MT* readers recently inquired about Sydney aeradio. "I haven't heard them in a while on the Southeast Asia air traffic control frequencies. Where have they gone?"

Many of you may be unaware that Sydney is no longer on the air. Perth Aeradio, Australia, has replaced them in all the MWARA nets in which Sydney had participated.

The Lufthansa LDOC station in Frankfort is another aero station that has left HF. Lufthansa flights now appear to use Berne and Stockholm radios for company traffic. Two other airline LDOCs that have not been reported in sometime are LTU in Dusseldorf and KLM in Amsterdam. Is anyone is hearing any traffic by these airlines to their ground LDOC stations? I would be very interested to hear from you.

New African Aero Frequency

Longtime UW reporter Gary Russell has uncovered a new East Africa RDARA (Regional/Domestic Air Route Area) frequency—5517 kHz. Gary reports that he has heard Addis Ababa, Ethiopia.; Asmara, Eritrea; and Mogadishu, Somalia, working aircraft on this frequency. The *WUN* newsletter indicates that Nairobi, Kenya, and Tripoli, Libya, have also been monitored on this frequency.

WUN's civilian aero columnist indicates that 5517 could be a gradual replacement for 5658 or simply an additional frequency to alleviate some of the congestion to be found on the usual 5 MHz channels.

Haverlah Does it Again!

Longtime *UW* reporter Jeff Haverlah has uncovered two new U.S. Strategic Command (USSTRATCOM) Zulu designators/frequencies: Zulu 270 and Zulu 315. You can see the current designator/frequency list as compiled from monitoring in Table 2. He also heard tactical units mention Zulu 330, but did not find the frequency. Thanks, Jeff, for the update.

NS/EP Replaced

In a news release from Bellcore, officials indicate that the regional Bell operating companies will form the National Telecommunications Alliance (NTA) to fulfill their National Security/Emergency Preparedness (NS/EP) obligations. This release mainly concerns the Bellcore sale to SAIC (Science Applications International Corporation). The transfer occurred at the end of December 1996. More information can be found on the internet at **http://www.bellcore.com/SALE/**.

Thanks to *UW* regular Jack Metcalfe for the heads up.

TABLE 1: Airline Company Frequencies

All communications on LDOC frequencies use upper sideband (USB) unless otherwise indicated. All frequencies below are in kilohertz (kHz).

Aer Lingus	Dublin, Ireland: 3010 5532 8924 13351 17916
Aeroflot	Moscow, Russia: 11354
Aerolineas Argentina	Aeroparque Jorge Newbery-Buenos Aires, Argentina: 6643 9013 10030 13240
AeroMexico	Mexico City DF, Mexico: 6640 9006 10033 Unid location: 13339
Air Afrique	Abidjan, Cote d'Ivoire: 17916
Air Britannia	UK: 9037
Air France	Paris, France: 6637 6712 8972 10093 11342 11345 11351
Air Jamaica	Kingston, Jamaica: 13356 (channel 1)
Air Mauritius	Port Louis, Mauritius: 5538 8933 13348
Air New Zealand	Auckland, New Zealand: 6637 13333 13345
Air Portugal (TAP)	Lisbon, Portugal: 5532 8924 13336
Air Seychelles	Seychelles: 8849 8967 13205
Alitalia	Rome, Italy: 5532 8931 10027 13336
Balkan Bulgarian Airlines	Sofia Bulgaria: 11273
British Airways	Speedbird Amsterdam, Netherlands: 8960 Speedbird-London, UK: 5535 8921 10072 13333
BWIA	Piarco, Trinidad: 5535 8924 11345
Canada 3000	Elite Ops-Toronto, ON Camada: 5475 8900
Cathay Pacific	Hong Kong, Hong Kong: 13333
CSA-Czech Airlines	Prague, Czech Republic: 5532 8924 10025 10027
Cubana Airlines	Boyeros, Cuba: 5529 5544 8927
Dragon Air	Hong Kong, Hong Kong: 6637 8921 13333
Egyptian Airlines	Cairo, Egypt: 6640 8933 11288
El Al Airlines	Tel Aviv, Israel: 5589 6677 8837 11318 13304
Faucett Airlines	Lima, Peru: 8188
Gulf Air	Falcon Ops-Manama, Bahrain: 5528 10033 11354 13330
Iberia Airlines	Madrid, Spain: 5529 8936 13327 17940
Icelandair	Reykjavik, Iceland: 5529
Japan Airlines	Tokyo, Japan: 6637 10093 11342 13324
Kuwaiti Airlines	Safat, Kuwait: 8970
LIAT	Adams, Barbados: 5568 Beef Island, British Virgin Island: 5568 V.C. Bird, Antigua: 5490 5568
LOT	Warsaw, Poland: 8924
LTU	Dusseldorf, Germany: 8921
Middle East Airlines (MEA)	Cedar Base-Beruit, Lebanon: 5538 10075 13300 13330
Milne Bay Air	Papua New Guinea: 6724
Moody Ops	Moody Aviation-Elizabethton, TN: 5571
Olympic Airlines	Athens, Greece: 3010 5637
Qantas Airlines	Sydney/Perth, Australia: 4687 6526 6637 8921 13342 13345 17922 21970
Royal Air	Montreal, PQ Canada: 6646
Royal Jordanian-ALIA Ops	Amman, Jordan: 9003 10027
Sabena Airlines	Brussels, Belgium: 5529 5645 8924 10078 13351
Saudi Airlines	Jeddah, Saudi Arabia: 5544 8822 8924 11288 13339 21994 Riyadh, Saudi Arabia: 8924
South African Airways	Johannesburg, South Africa: 5532 8930 8933 11354
Turkish Airlines	Ankara/Istanbul, Turkey: 8829
United Airlines	Chicago, IL USA: 5535
VARIG	Belem, Brazil: 5553 8939 11366 Recife, Brazil: 8939 Rio de Janeiro, Brazil: 5541 11366

COMMON CARRIERS

ARINC-Aeronautical. Inc	Honolulu, HI USA: 11342 New York, NY USA: 3413 3494 6640 8903 8933 11342 13309 13330 San Francisco, CA USA: 6640 11342
Berne Radio	Berne, Switzerland: 3010 4564 4654 4670 6526 6643 6705 6742 6945 8936 9211 9225 10046 10069 13205 13324 14593 15046 15050 15835 17931 18023 18480 20035 20870 21933 21988 23285 25500
Lima Flight Support	Lima, Peru: 5535 8885 11306 17937
Miami Radio	Miami, FL USA: 6637 8095 8959 10033 11470
Portishead Radio	Portishead, UK: 5609 5610 6734 8170 8930 8960 10291 11306 14890 15964 20065
Rainbow Radio	Tors Cove, NF Canada: 3446 5604 8819 13255 13285
Rockwell Radio	Cedar Rapids, IA USA: 6637 8933 10075 11288 11306 13348
Stockholm Radio	Stockholm, Sweden: 5290 5541 6826 6876 7524 8930 10206 10286 10575 10790 10795 10805 10865 10970 11345 13342 13576 13942 14645 17916 18042
Universal Radio	Houston, TX USA: 6637 10075 13330 17940

You can find the latest LDOC list on the *Ute World* online web site (**http://www.grove.net/~larry/uteworld.html**). If you discover a new LDOC, we would appreciate you passing that along via E-mail or snail mail for the rest of our *MT* readers.

TABLE 2: USSTRATCOM Zulu Designators/Frequencies

Z100	3068.0	Z150	5800.0	Z205	11494.0
Z105	3116.0 (tentative)	Z155	5875.0	Z210	11229.0
Z110	3134.0	Z160	6715.0	Z211	12070.0
Z115	3143.0	Z165	6757.0	Z215	13242.0
Z120	3295.0	Z170	7831.0	Z220	13245.0
Z125	4495.0	Z175	9016.0	Z225	13907.0
Z130	4472.0	Z180	9057.0	Z230	15046.0
Z135	4745.0	Z185	9809.0	Z270	18027.0
Z140	5026.0	Z190	10204.0	Z315	23872.0
Z145	5705.0	Z200	11181.0		

Utility Loggings

Larry Van Horn

Abbreviations used in this column

ALE	Automatic Link Establishment
ANDVT	Advanced Narrowband Digital Voice Terminal
ARQ-E3	Single channel synchronous transmission and automatic repetition teleprinter system
ARQ-M2	Multiplex synchronous transmission and automatic repetition teleprinter system with two data channels
USAF	U.S. Air Force
AT&T	American Telephone and Telegraph
CAMSPAC	Communications Area Master Station-Pacific
CW	Continuous Wave (Morse Code)
DLA	Defense Logistics Agency
ETA	Estimated Time of Arrival
FAA	Federal Aviation Administration
Fax	Facsimile
FEC-A	Forward Error Correction,
FEMA	Federal Emergency Management Agency
FF	French Forces
GHFS	Global HF System
HF	High Frequency
ID	Identification
LDOC	Long Distance Operational Control
LSB	Lower Sideband
MARAD	Maritime Administration
MFA	Ministry of Foreign Affairs
MOD	Ministry of Defense
NATO	North Atlantic Treaty Organization
NECN	National Emergency Coordinating Network
NS/EP	National Security/ Emergency Preparedness
Ops	Operations
RAF	Royal Air Force
RDARA	Regional and Domestic Air Route Area
RTTY	Radioteletype
SAM	Special Air Mission
Selscan	Selective scan
SHARES	Shared Resources
SITOR-A	Simplex teleprinting over radio system, mode A
SITOR-B	Simplex teleprinting over radio system, mode B
SOW	Special Operations Wing
USN	U.S. Navy

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Time Universal)

2270.0 JSR-Israeli Mossad number station at 2104. (Takashi Yamaguchi-Nagasaki, Japan) *Welcome back, Takashi. I hope you check in often-Larry.*

2598.0 VON-CCG St. John's, NF Canada, with navigation message at 0839. (Nicolas Gagnon-CIDX DXpedition, PQ) *Welcome aboard, Nicolas-Larry.*

3113.0 Air Force 2 working Andrews with move to SAM 974's frequency F-114. (Jeff Jones-CA)

3413.0 Shannon VOLMET, Ireland, with aviation weather at 0620. (Gagnon-PQ)

3455.0 Tokyo Aeradio, Japan, working Air Mike 976 at 1252. (Gary Russell-Urbana, IL) *Klingenfuss shows this freq alocated to CWP. Must have recently been pressed into service-Larry.*

3540.0 UGC-St. Petersburg Radio, Russia, with CW ID at 1855. (Robin Hood-UK)

4053.0 Unidentified station with 5-letter groups in CW at 0205. (Jack Metcalfe-KY)

4055.0 FAA selscan noted here at 0200. Have you ever heard any FAA selscan activity below 4 MHz? (Metcalfe-KY) *No-Larry.*

4492.0 Biglake 00, 01, 03, 05 and 06 apparently working data traffic with each other at 0518. (Jones-CA)

4704.4 India 9 working Habitat (NAS Whidbey Island) at 0505. Also heard ANDVT communications. (Jones-CA)

4715.0 MVU-RAF VOLMET with aviation weather at 0528. (Gagnon-PQ)

4724.0 McClellan GHFS with long code groups at 0621. (George Washburn-Milpitas, CA)

4757.0 ANDVT communications noted here at 2321. (Jones-CA) *Mystic Star-Larry.*

5078.0 E7Q working Q3Z with alligator coordination traffic at 0057. (Jones-CA)

5211.0 KPC324-Virginia Task Force 2, checking into FEMA NECN exercise at 1433. Station expressed interest in joining the regular FEMA Tuesday net. WTDL-MARAD King's Point, NY, with a 1512 check in. DLA293-DLA Alexandria, VA, at 1622. WNFT417-Bellcore Washington, D.C., at 1618. (Metcalfe-KY)

5236.0 WPEH728-AT&T Conyers, GA, as coordinating station for the SHARES 96-3 exercise. Check-ins included: Big Lake, USAF Reserves-San Antonio, TX; WNWK804-Cincinnati Bell, OH, at 1400; S4L-2nd U.S. Army Atlanta, GA, at 1509; and KCJ20-FAA Farmington, NM at 1553. (Metcalfe-KY)

5421.0 MTI-Royal Navy, UK with 75 baud RTTY test tape at 2330. (Roger Parmenter-Hyannis, MA)

5517.0 Asmara Aeradio, Eritrea, working Addis Ababa, Ethiopia. Asmara working Mogadishu, Somalia at 2300. Appears to be a RDARA for Ethiopia, I don't find this one listed. (Russell-IL) *This has been recently reported as a new RDARA. I doubt it is just Ethiopia-Larry.*

5530.0 CIO2-Israeli Mossad at 2049. (Yamaguchi-Japan)

5634.0 Mauritius Aeradio working Qantas 54 at 2244. (Russell-IL) Seychelles Aeradio working various aircraft at 2100. (Harry Riddell-Rochester, NY)

5643.0 Brisbane Aeradio, Australia, working Kiwi 973 at 1245. (Russell-IL)

5658.0 Asmara Aeradio, Eritrea, working Khartoum, Sudan, and Addis Ababa, Ethiopia at 2254. Sana'a Aeradio, Yemen, working Iran Air 55 at 2253. (Russell-IL)

5680.0 Sailing vessel *Proteus* working NMC-CAMSPAC Pt. Reyes, CA USA at 0400. (Skip Cadman-Astoria, OR)

5684.0 Andrews working SAM 26000. (Jones-CA)

5691.0 Khabarovsk VOLMET, Russia, with Russian weather reports at 2122. (Yamaguchi-Japan)

5696.0 Coast Guard Rescue 1601 working Group Humboldt Bay, OR, at 0801. (Gordon Levine-Anaheim, CA)

5717.0 Canforce 3376 (de Havilland Buffalo) working Vancouver military at 0341 with phone patch to COMOX Ops, BC. (Matt Cawby-Mt. Lake Terrace-WA)

6270.0 ULX-Israeli Mossad number station at 1333.(Yamaguchi-Japan)

6273.0 LSF-Israeli Mossad number station at 1445. (Yamaguchi-Japan)

6293.0 UFFJ-*TK Nefterudovoz 48* (ore/oil carrier) working UJE-Nizhny Novgorod Radio in CW at 1543. (Hood-UK)

6308.0 UYHH-*TKH Volga* (Danube river cruiser) working USO5-Izmail Radio with message from Captain Vdovichenko in 50 baud RTTY at 1552. (Hood-UK)

6314.5 SAB301-Goeteborg Radio, Sweden, with SITOR idler then ship message traffic at 2236. (Larry Van Horn-Brasstown, NC)

6315.0 GKE3-Portishead Radio, UK, with SITOR idler/callsign only CW marker at 2233. ZLA-Awaura Radio, New Zealand, with SITOR idler/callsign only CW marker at 1320. (LVH-NC)

6315.5 USU-Mariupol Radio, Ukraine, with SITOR idler/callsign only CW marker at 2234. KFS-San Francisco Radio, CA US, with SITOR idler/callsign only CW marker at 1317. (LVH-NC)

6320.0 DAN-Norddeich Radio, Germany, with SITOR idler/callsign only CW marker at 2222. (LVH-NC)

6322.0 OST-Oostende Radio, Belgium, with SITOR idler/callsign only CW marker at 2217. (LVH-NC)

6330.0 LZW34-Varna Radio, Bulgaria, with SITOR idler/DE CW marker at 2201.(LVH-NC)

6344.0 SVB3-Athens Radio, Greece, with CW DE marker at 2241. (LVH-NC)

6349.0 PPJ-Juncao Radio, Brazil, with CW V marker at 2242. (LVH-NC)

6382.0 TBA6-Turkish Navy Ankara, Turkey, with CW V marker at 0438.(LVH-NC)

6389.0 CTP-NATO Lisbon Radio, Portugal, with CW V marker at 2254. (LVH-NC)

6426.2 LYK-Klaipeda Radio, Lithuania, with CW CQ marker at 2302. (LVH-NC)

6457.5 JOR-Nagasaki Radio, Japan, with CW CQ marker at 2311. (LVH-NC)

6470.0 SXA-Greek Naval Radio, Piraeus, Greece, with CW V marker at 2316. (LVH-NC)

6482.0 CLA-Havana Radio, Cuba, with CW CQ marker at 2319. (LVH-NC)

6498.0 PCD-Israeli Mossad number stationat 2035. Parallel transmission to 3150/4270. (Yamaguchi-Japan)

6532.0 Tokyo, Japan, working Air Mike flight at 0456. (Gerald Brookman-Kenai, AK)

6553.0 Nadi Aeradio, Fiji, working Qantas 100 at 1246. (Russell-IL)

6556.0 Ujumg Pandang Aeradio, Indonesia, working Qantas 1 at 1244, handed off to Jakarta. (Russell-IL)

6637.0 Maintenance Watch Auckland working New Zealand 7 at 1207. (Riddell-NY)

6750.0 Papa working Fox Tango at 0530 regarding Greyhound. (Jones-CA)

6815.6 22 working 03 at 0114. Talking about target on gadget at 18 nautical miles and stations went to satellite communications. (Jones-CA)

7445.0 MIW2-Israeli Mossad number station at 1423. (Yamaguchi-Japan)

7525.0 TYE-ASECNA Cotonou, Benin, sending weather using 96 baud ARQ-M2 at 2236. (Fernand Vaillancourt-St. Pamphile, PQ Canada)

7540.0 JSR-Israeli Mossad number station at 1304. (Yamaguchi-Japan)

7549.1 WNIM867-SW Bell St. Louis, MO, calling WNIY791-SW Bell San Antonio, TX, at 2130 on channel 44. Didn't Southwest Bell change names to SBC Communications? (Metcalfe-KY)

7552.1 WNIM867-SW Bell St. Louis, MO, and WNCP450-SW Bell Creve Coeur, MO, at 2115 on channel 45. Moved to channel because of ALE pulses. (Metcalfe-KY)

8039.5 P7X-U.S. military, with 5-letter groups in CW at 1648. Two high speed data transmissions between CW transmissions. (Metcalfe-KY)

8071.5 Mike working Romeo with unit damage reports at 1339. Mentioned 18 knots top speed. (Metcalfe-KY) *Could be any number of folks, Jack-Larry.*

8170.5 Uniform 13 calling Charlie 3 with battle status updates in LSB at 1416. (Metcalfe-KY) *U.S. Army frequency-Larry.*

8280.5 Uniform 23 noted here in LSB at 1426. (Metcalfe-KY) *Another U.S. Army frequency-Larry.*

8279.0 UBEM-*TKH STK-1004* (sea-river cargo vessel of NW Shipping Company) working Helsinki Radio for phone patch to Istanbul at 0952. (Hood-UK)

8418.0 IAR-Rome Radio, Italy, with SITOR idler/callsign only CW marker at 0405.(LVH-NC)

8418.5 LGB-Rogaland Radio, Norway, with SITOR idler/callsign only CW marker at 0404.(LVH-NC)

8419.5 PPR-Rio de Janeiro Radio, Brazil, with SITOR idler/callsign only CW marker at 0400. (LVH-NC)

8420.5 HEC-Berne Radio, Switzerland, with SITOR idler/callsign only CW marker at 0357. (LVH-NC)

8421.5 9AR-Rijeka Radio, Croatia, with SITOR idler/callsign only CW marker at 0355. (LVH-NC)

8428.5 ZSC-Cape Town Radio, South Africa, with SITOR idler/DE CW marker at 0334. (LVH-NC)

8429.0 EAD-Madrid Radio, Spain, with SITOR idler/callsign only CW marker at 0333. (LVH-NC)

8432.5 UFN-Novorossiysk Radio, Russia, with SITOR idler/callsign only CW marker at 0329. (LVH-NC)

8434.5 LPD-General Pacheco Radio, Argentina, with SITOR idler/callsign only CW marker at 0326. (LVH-NC)

8435.0 XSQ-Guangzhou Radio, China, with SITOR idler/callsign only CW marker at 1326. (LVH-NC) F/C-Single letter HF CW marker at 1120. (Yamaguchi-Japan)

8437.0 4XZ-Israeli Naval Haifa, Israel, with CW V marker at 0318. (LVH-NC)

8439.0 PBC38-Dutch Naval Goeree Island, Netherlands, with 75 baud RTTY RY test tape at 1146. (LVH-NC)

8448.0 A9M-Hamala Radio, Bahrain, with CW CQ marker at 0250. (LVH-NC)

8453.0 HWN-French Naval Paris, France, with 75 baud RTTY RY test tape at 0239.(LVH-NC)

8461.0 ZSC-Cape Town Radio, South Africa, with CW CQ marker at 0229. (LVH-NC)

8465.0 MIW2-Israeli Mossad number station at 1423. Parallel transmission noted on 7445. (Yamaguchi-Japan)

8468.0 FUV-French Naval Djibouti, with 75 baud RTTY RY test tape at 0141. (LVH-NC)

8484.5 HZG-Damman Radio, Saudi Arabia, with CW DE marker at 0219. (LVH-NC)

8492.0 PPR-Rio de Janeiro Radio, Brazil, with CW V marker at 0218. (LVH-NC)

8502.0 PPL-Belem Radio, Brazil, with CW V marker at 0214. (LVH-NC)

8564.0 D3E51-Luanda Radio, Angola, with CW CQ marker in heavy RTTY QRM at 0145. (LVH-NC)

8565.0 FUB-French Naval Paris, France, with 75 baud encrypted RTTY traffic at 0155. (LVH-NC)

8573.5 LYL-Klaipeda Radio, Lithuania, with CW CQ marker at 0152. (LVH-NC)

8598.0 OXZ4-Lyngby Radio, Denmark, with CW CQ marker at 0128. (LVH-NC)

8643.5 UUI-Odessa Radio, Ukraine, with 50 baud RTTY message traffic at 0112. (LVH-NC)

8646.0 LPD86-General Pacheco Radio, Argentina, with CW V marker at 0109. FUJ-French Naval Noumea, New Caledonia, with 75 baud RTTY RY test tape at 1202.(LVH-NC)

8663.0 HMZ-Pyongyang Radio, North Korea, with CW CQ marker at 0104. (LVH-NC)

8685.0 IRM-CIRM Rome, Italy, with CW V marker at 0052. (LVH-NC)

8688.5 ZSC-Cape Town Radio, South Africa, with CW DE marker at 0050. (LVH-NC)

8879.0 Perth Aeradio, Australia, working various aircraft at 2025. (Riddell-NY)

8903.0 Douala Aeradio, Cameroon, working a Springbok flight at 2322. (Russell-IL)

8968.0 Wise 81 (16 SOW) with phone patch to Hurlburt Ops via McClellan GHFS at 1739. (Russell-IL) Mend 23-USAF C-130 with phone patch to Gunrunner via McClellan GHFS at 1737. (Jim DeWitt-Sacramento, CA via Grove Fax machine)

8971.0 Demon 801 working Western Sky 801 off station at 0344, gave ETA to North Island as 15 minutes. (Cawby-WA)

9010.0 Ottawa requesting Vancouver to monitor 8151/14985.5 for a HF trial. Vancouver said they would transmit a steady tone at 4,000 watts on each frequency at 0127. (Cawby-WA)

9031.0 RAF Volmet weather broadcast at 1036. (Allen Wires-East Point. GA)

9106.0 Bravo 050 working Foxtrot after several ALE bursts. Both returned to scan at 2138. (Metcalfe-KY) *This is a USAF Air Mobility Command ALE C2 frequency-Larry.*

9123.0 B53D and AU44 with number/letter groups in CW at 1437. (Metcalfe-KY)

9123.5 Uniform 41 with battle reports for unidentified stations. Each message repeated three times in LSB at 1636. (Metcalfe-KY) *This is a U.S. Army Corps of Engineers frequency-Larry.*

9991.5 SAM 049 working Andrews at 0351. (Jones-CA)

10125.0 MIW2-Israeli Mossad number station at 1218. Parallel transmission noted on 9130/12747. (Yamaguchi-Japan)

10484.0 MFA Sofia with information bulletin using 150 baud RTTY at 1042. (Hood-UK)

10493.9 RFTJ-FF Dakar, Senegal, with ARQ-E3 transmission at 0549. (Robert Hall-Capetown, RSA)

10856.0 Stockholm Radio, Sweden, working Lufthansa 8455 at 1615. (Gagnon-PQ)

10920.0 RFTU-FF Dakar, Senegal, with "controle de voie" using 48 baud ARQ-E3 at 2130. RFAB-Pairs, France, sending "revue de presse" using 48 baud ARQ-E3 at 0345. (Vaillancourt-PQ)

11175.0 Okie 11 (flight of four F-15s) with phone patch to Red Flag Ops at 1637. (DeWitt-CA)

11178.0 Falcon 01 working Bluestar at 1300. (Riddell-NY)

11253.0 MVU-RAF VOLMET with ID at 1343. (Gagnon-PQ)

11297.0 Russian females. Presumed Kiev then Rostov VOLMETs at 1253. (Riddell-NY) Kiev VOLMET at 1255. Rostov VOLMET at 1556. Both operators in Russian. (Gagnon-PQ)

11494.0 WGY904 calling Domestic on Zulu 205 with a six digit message at 1631. (DeWitt-CA)

12581.0 LSD836-Buenos Aires Radio, Argentina, with SITOR/callsign only CW marker at 2150 (LVH-NC)

12583.5 CBV-Valparaiso Radio, Chile, with SITOR/callsign only CW marker at 2146. (LVH-NC)

12662.0 7TF8-Boufarik Radio, Algeria, with CW CQ marker at 2059. (LVH-NC)

12699.0 HPP-Panama Radio, Panama, with CW V/CQ marker at 2038. (LVH-NC)

12799.5 PCH51-Scheveningen Radio, Netherlands, with CW DE marker at 1626. (LVH-NC)

12829.5 XFM-Manzanillo Radio, Mexico, with CW CQ marker at 1621. (LVH-NC)

12923.0 HLW2-Seoul Radio, South Korea, with CW CQ marker at 1606. (LVH-NC)

13022.0 SPE63-Szczecin Radio, Poland, with CW DE marker at 1551. (LVH-NC)

13951.0 Unidentified station with 5-letter groups in SITOR-A at 1650. Possible diplomatic station. (Metcalfe-KY)

15874.0 MFA Paris, France, with 5-letter groups using 192 baud FEC-A at 1108. (Vaillancourt-PQ)

15920.4 CFH-Halifax, NS, Canada, with RTTY transmission at 1724. (Hall-RSA)

15974.0 MFA Havana, Cuba, with Spanish traffic to Tanzania embassy and news of embacuba Iran using 50 baud RTTY at 1730. (Vaillancourt-PQ)

16077.0 RFFA-MOD Paris, France, with ARQ-E3 transmission at 1732. (Hall-RSA)

16807.0 ZLA-Awaura Radio, New Zealand, with SITOR/callsign only CW marker at 2034. (LVH-NC)

16798.0 Unidentified station sending "press report via DZJ" with Philippines news (in English) using SITOR-B at 1136. (Hood-UK)

16811.0 CBV-Valparaiso Radio, Chile, with SITOR/callsign only CW marker at 2205. (LVH-NC)

16831.5 FFT-St. Lys Radio, France, with SITOR/callsign only CW marker at 2014. (LVH-NC)

16839.0 UFN-Novorossiysk Radio, Russia, with traffic to UEVI-*TKH Mys Khako* for Captain Kovalenko in SITOR-A at 0736. (Hood-UK)

16960.0 CKN-Canforce Esquimalt, BC, Canada, with 75 baud NAWS RTTY test tape at 1728. (LVH-NC)

16961.5 FUF-French Naval Fort de France, Martinique, with 75 baud RTTY RY test tape at 1727. (LVH-NC)

17064.8 EAD-Madrid Radio, Spain, with CW DE marker at 1635. (LVH-NC)

17170.4 PJC-Williamsted Radio, Curacao, Netherlands Antilles, with CW V marker at 1558. (LVH-NC)

17180.0 HWN-French Naval Paris, France, with 75 baud RTTY RY test tape at 1554. (LVH-NC)

17198.9 PCH60-Scheveningen Radio, Netherlands, with CW DE marker at 1539. (LVH-NC)

17213.9 SPH-Gdynia Radio, Poland, with CW DE marker at 1536. (LVH-NC)

17231.2 CWA-Cerrito Radio, Uruguay, with CW CQ marker at 1536, with QRN from SITOR idler. (LVH-NC)

17937.0 BPDL working Kingston, Jamaica (LDOC) at 1658. (Gagnon-PQ)

18031.0 MFA Havana, Cuba, with 5-letter groups then news in Spanish at 1900 using 50 baud RTTY. (Vaillancourt-PQ)

18761.0 MFA Paris, France, with 5-letter groups using 192 baud FEC-A at 1916. (Vaillancourt-PQ)

20302.0 NKW-USN Diego Garcia with fax chart at 0940. (Hall-RSA)

22478.0 CBV-Valparaiso Radio, Chile, with CW V marker at 2140. (LVH-NC)

22544.0 FUM-French Naval Papeete, Tahiti, Society Islands, with 75 baud RTTY RY test tape at 2125. (LVH-NC)

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Radio Canada International *Not* Dead — Again

The 123 beleaguered staff at RCI were about to go home on Friday afternoon, December 6, when their bosses told them that the CBC and the government had been unable to come up with any more funding, so RCI would have to close down at the end of March. RCI's champion in the government, Heritage Minister and Deputy Prime Minister Sheila Copps, was blamed for not keeping her promise. But it turned out she was out of the country at the time, under the impression that a funding package was in the works. The closure announcement was made in order to forestall growing rumors over the weekend, but it was premature. *The Globe and Mail* blamed Clerk of the Privy Council Jocelyne Bourgon, while an interdepartmental debate on how to finance RCI was still going on. Copps returned, set to work to finish the funding job, and in less than a week she and Foreign Minister Lloyd Axworthy had this provisional package totalling C$16 million, the same as last year: $6M from Foreign Affairs, $6M from the Heritage department, $3M from Canadian International Development Agency, $1M from Defence department—and zero from CBC.

Now that CBC no longer has any responsibility for RCI, she expects the international broadcaster to become a cornerstone of Canadian foreign policy, with continuing funding, not subject to yearly death threats. And Axworthy gave assurances that RCI will not be subject to government editorial control. The Coalition to Restore Full RCI funding, which was gearing up for another write-in campaign, continues to push for funds to be increased to previous levels.

The relays of BBC, Austria, Korea, and others we rely upon will continue via Sackville: We hope that RCI will also continue to relay a lot of excellent CBC programming to the world. CBC itself, however, has also undergone drastic cuts with hundreds of staff losing their jobs, and plans to revamp programming later this year, such as merging *Morningside* with *Sunday Morning*. (This report based on extensive monitoring and a flood of press reports forwarded by Chet Copeland, Kevin Hecht, R. J. Fliegl, Mike Cooper, David Alpert, Bill Westenhaver, David M. Clark, Harold Sellers, Andy Kirby, Alfred Thornton, Nick Terrence, Ivan Grishin, Debby Stark, Sheldon Harvey, Aaron Pilchick)

For news of other stations' financial problems, see Australia, Belgium, Cuba, Papua New Guinea, South Africa, United Kingdom, USA-VOA and WVHA below.

AFGHANISTAN The Anti-Taleban R. Afghanistan supporting former president Borhanoddin Rabbani, is on 7100 in Dari, Pashto at 0730-0835, 1130-1230. Pro-Rabbani officials in Tashkent say it broadcasts from Taloqan, Takhar Province, in northern Afghanistan; on same freq as V. of Free Tajikistan, and may well be sharing facilities. (BBC Monitoring)

ALASKA [non] W.C.B.C., parent org of KNLS, wants to reach more of world with new SW site outside US; designing mobile transmitting system to be movable if there are political problems (Kevin Chambers, Dave Dvorak, KNLS, HCJB *DX Partyline*) *Previously czecked out Czech Republic - gh*

ALGERIA R. Algiers Int'l, 15205.2, English at new time 1400-1500 replacing 1600, //15160 and unheard 11715; no English heard between 1600 and 2100. Strong on 15205.2 but QRM from VOA 15205 (Brian Alexander, PA)

ANGOLA V. of the Resistance of the Black Cockerel, VORGAN, the UNITA radio station, will be privatized as soon as all political issues have been settled. Buyer will be the Polytechnic Academy, a Luanda-based company involved in all media. The new station will be called R. Despertar [Wake Up Radio], continuing on 11830, 7100, 9700 (KUP news agency via BBCM)

R. Nacional reactivated on 9720.3 from 0500, not as strong as VORGAN on 9750; RNA also on 7245, 9534.8 but not on 11954.8 (Tony Jones, Paraguay, *Cumbre DX*)

ANGUILLA Government here was about to approve Dr Scott's new 100 kW SW, after the site is fenced (Larry Magne via Marie Lamb, *Cumbre DX*) Harold Vanterpool at the station told me Scott had him shut down the AM and FM station Nov 24, didn't know why, and no plans known to start SW (Hans Johnson, *ibid.*)

ARGENTINA RAE tested via Internet in November at **http://www.primenet.com/~miglia/rae.htm** (Gabriel Iván Barrera via David Sharp, *Cumbre DX*) Seemed not live stream, but segments in several languages about Mar del Plata Film Festival; RAE also plugged it on 11708.8. Occasionally audible UT Thu around 0235 with *DXers Special Program* but fails to attribute news to individual DXers quoted (gh)

ARMENIA V. of Armenia, English at 2130 on 9965, 7480 (Roger Chambers, Tom Sundstrom, BBCM)

AUSTRALIA Three proposals for downsizing R. Australia due to A$55M budget cut for ABC in 1997-98: 1) cut $1M, losing 15-20 staff, French and Cantonese services; 2) delete Pidgin, French, Cantonese, Khmer, Vietnamese; reduce Mandarin, Indonesian to only two hours a day; English service a composite of RA and ABC domestic; 3) ABC asks Special Broadcasting Service to take over remaining language services, drop RA English in favour of a relay of ABC domestic (*Weekend Australian* via Mike Bird, RN *Media Network* via BBCM) RA programming to be revamped Jan 22, with 60-minute news and current affairs program every three hours, and still 10 minutes of news on the hour every hour, removing "annoying muzak" although music features will remain. Oz news weekdays at 0105, 0305, 0505, 0905, 1105, 1305, 1505, 2305, and weekends from 0905 (RA *Feedback*)

BELGIUM BRTN news announced that RVI would have drastic budget cut from Nov 1997: no longer German, Spanish, Arabic, just Dutch, French, English; hours per week from 300 to 140; let staff go who cannot switch languages. Wavre site in Belgium to be used only for nearby parts of Europe, Africa; to NAm and other targets via relays (Guido Schotmans, Belgium, *rec.radio.shortwave* via Kevin Hecht) To NAm may use Bonaire or Sackville; Eu via Germany; Au/SAf via Madagascar; As/SAs via Kamchatka, Russia (RVI via VOA *CW* via Mick Ogrizek, *EDXP*) Always two transmitters at a time to each target (RVI *Radio World*)

CAMEROUN R. Cameroon, Yaoundé, reactivated on 4850 including English news 2100-2115 (Finn Krone, Denmark, DSWCI *DX Window*) And 2320-2401* in French, *0434-0500+. Another day at 2035 interviewed Chinese dissident in English, played Chinese music (Brian Alexander, PA) Also English at 2035, 0520 (Ed Rausch, NJ) Quite strong at 2100; must be at least 100 kW as listed before (Roger Chambers, NY)

COLOMBIA Longtime mystery on 5873.7 solved: it's a pirate first logged by Juan Carlos Codina and then chased by myself without much success for over three years. In Nov at 2152 full ID and sked given as R. El Sol, at Villa Moreno, some 40 km NE of Pasto in SE Colombia, M-F 2100-2300, Sat/Sun 1930-2400, but at 2158 obliterated by BBC 5875. Later they acknowledged my report by phone with power as 50 watts (Henrik Klemetz, *Dateline Bogotá* via DSWCI *DX Window*)

COSTA RICA RFPI first-quarter programming changes: your columnist's *Continent of Media*, half an hour monthly in the third week, following *World of Radio* Fri 2030, Sat 1830, Tue 1930 plus repeats 7 and 15 hours later. *Youth Theater: The Costa Rican Academy Players*, Wed 2330. *University of the Air--Real Politics* with Michael Parenti, Tue & Thu 2230. James

All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; Z-96 = Summer season; W-96 = Winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there.

Bean's *Spiritual Awakening* becomes a weekly half-hour Sun 2100. Replacing it at 2355 daily are *Earthwatch Radio* and *Earth & Sky. Global Community Forum* live mainly UT Fri 0200, sometimes also UT Sun 0400. Also experimented with *Pacifica Network News* weekdays at 2300-2330 via RealAudio feed, and may add it to 2nd quarter sked; 15050-AM day, 7385-AM and 6205-USB night. (RFPI)

TIAWR is incredibly slipshod, putting on programs at unpredictable times—24-week-old *AWR Wavescan* heard one Wed until 2140 on 13750, 9725 only, but unreliable at scheduled times of Sun 1100, 2300 (gh) The American announcer in London is Dave Barasoain, a Basque name, from Atlanta (Jeff White, Bill Matthews, Finn Krone)

Faro del Caribe has new 5 kW transmitters on 5055, 9645, and older one on 6175 at new site in San Isidro, Heredia, at 2000-1200 including English 0300-0400. R. Casino has oldest transmitter in CR, since 1945 with 1 kW on 5954v at 1030-2400, fax 758-3029. R. Reloj official sked is 1300-0100 6006, 0100-1300 4832, but sometimes forgets to switch so 6006 heard after 0100 (Ulis Fleming, CR, *Cumbre DX*) Not using 6006 due to TVI; a nearby resident fired at the antennas with a shotgun (Ulis Fleming, *Cumbre DX*)

CROATIA CR, Zagreb, English news observed: 0706 M-F, 0803 Sa/Su, 0903 M-F, 1303, 1903, 2303, on some of: 5895, 5920, 7165, 9830, 11635, 11830, 13830 (Alan Roe, England, *World of Radio*)

CUBA *Rebelde-DX*, UT Sat 0530v has been on 5025 since May; attempts by others to do a DX program on Cuban domestic radio failed because they wanted too much time. Thanks for the publicity in your Spanish DX report (Frank Díaz Donikián, *Rebelde-DX*)

RHC English to Europe 2100-2200 changed to 9585-USB, 9620 from 13715, 13725-USB (Arnie Coro) Plus Esperanto Sundays 2200 on 9620 only (gh)

Cuba continues to jam WRMI 9955 most of the time, even when it's not carrying exile programming but DX shows in English, Spanish, or even Portuguese. Trying to be helpful, I sent RHC the schedule for exile programming (gh)

[non] La Voz del CID, anti-Castro station, could grow silent for lack of money. Húber Matos says donations from exile community are not meeting expenses of $16K a month. He insists no aid comes from the US government. In the 1980s, CID received large donations from some LAm governments, which will be identified once Cuba is free. Transmitter is in one of those countries, valued at $500K. Daily 12-hour broadcasts produced in Miami give time to Cuban Unity, Alpha 66, Miami Medical Team, Brothers to the Rescue, Brigade 2506, Revolutionary Directorate. Power is 50 kW with 15 dB antenna gain for 500 kW ERP on 9940, 6305. Address: P.O. Box 654738, Miami, FL 33265-2631 (Armando Correa, Miami *Herald* via Aaron Pilchick, Mike Cooper)

CZECH REPUBLIC R. Prague's reactivated 1400 to us on 13580 is mostly music on Sats-—folk one week, Dixieland the next (gh)

DOMINICAN REPUBLIC R. Amanecer on 3139.93 = 2 x 1570 where also audible //6025 at 0230-0330+, Spanish religion, ID (Brian Alexander, PA) Complete program sked appears on website (gh) **http://jupiter.tricom.net/amanecer** (Al Quaglieri *rec.radio.shortwave*)

R. Cristal Int'l, 5013.4 at 0026 with English magazine program on tourism, Internet, mailbag on a UT Thu until 0045 merengue, much better signal than usual (Don Moore, IA, *Cumbre DX*)

ECUADOR R. Jesús del Gran Poder, 5050.43 heard from 2200 through 0200, lacking IDs at hour top but a times such as 2319 (Tom Sundstrom, NJ) At 0200 on 5050.4 IDs as Francisco Estereo (Jay Novello, NC) Same ID heard during 0339-0522* with freqs as 106.9, 102.5 (Giovanni Serra, Italy) Seems to use Francisco Estereo program as a filler, heard *2215-2257, then JDGP. Both studios are inside San Francisco Cathedral in downtown Quito (Henrik Klemetz, *Dateline Bogotá* via *DXW*)

John Beck of *Ham Radio Today* has been appointed to the newly created position of HCJB Station Manager (HCJB)

GUAM *Pacific DX Report* via KTWR: Sat 0940 11830, Mon 1615 11580, Tue 0900 15200. Special *EDXP* QSLs available for return postage (Bob Padula, *Electronic DX Press*)

HONDURAS New station on 5890, HRMI, La Voz de Misiones Internacionales, Tegucigalpa, Dec 17 at 1250-1325+, new 200 W SW for the 1480 station, to be increased to 5 kW, partly in English, great signal (David Crawford, FL, *Cumbre DX*) Sked is 1200-0500 (Ulis Fleming, *ibid.*) Mixed with Vilnius/Germany 2352-0100 (Jerry Berg, *ibid.*)

ICELAND Reykjavík on new 7735 //9275 at 1900-1930* in Icelandic, closing with signature jingle on suppressed carrier USB (Brian Alexander, PA, *World of Radio*)

INDONESIA RRI is gradually replacing SW transmitters with FM (TVRI via BBCM)

INTERNATIONAL WATERS [non] *Electra* radio project, joint venture of Scott Becker and Allan Weiner, probably will not sail until spring; ship is waiting for minor hull repairs, painting. Funding will not happen in [*sic*--until?] spring (Anita McCormick via Chris Lobdell, NASWA *Journal*)

IRAN [non] On 6055 a station calling itself V. of Azerbaijan at *1630-1730* in Azeri with Turkish music, anti-Iranian government and Armenia, "for unity of south and north Azerbaijan," jammed (Ali Can Yasar, Turkey, DSWCI *DX Window*) Related to V. of Southern Azerbaijan, 1530-1630 on 9927? (Hans Johnson, *Cumbre DX*)

Mojahedin-e Khalq clandestine has started a website: **http://www.iran-e-azad.org/english/index.html**(Voice of Israel via BBCM) Persian via Iraq SW at 0300-0900 and 1400-2200 (BBCM) on 9430 with address in Denmark to 2058* Thursday only (Jay Novello, NC) Also on 5140 lately (Wolfgang Büschel, *BC-DX*)

IRAQ *R. Iraq Int'l* resumed English in December after a sesquiyear without it, heard 2332-2356 on 11895 tho announced as "10 and a half to 11 GMT daily on 11890." *V. of Rebellious Iraq* reported that the Iraqi government has set up jamming stations against that station, VOA and BBC. Cost was $5M, collected from tax revenues, telegram, water and telephone fees. The regime previously set up 200 jammers in 1981, each costing $250K, most destroyed during Operation Desert Storm in 1991 (BBCM)

JAPAN New multilingual morning service to Asia at 2100-2400 on 11685, 9860 opens and closes with English news. Also has NHK domestic service relay to As 0900-1400 on 9855, 9750, 2000-2400 on 11910, 11665 (BBCM)

[non] R. Japan resumed relay via Sri Lanka on Dec 9, replacing alternative sites; includes English hours at 1400 on 12045, 1700 on 11880, 0100 on 11890 (Tooru Yamashita, ABI)

KOREA NORTH Jamming on 31 meter band around 2100-2200 UTC: 9475 against KTWR, off at 2125 in time for *World of Radio* Thu 2130; 9755 vs VOA, 9640 vs RKI (Wolfgang Büschel, Germany, *BC-DX*) All broadcasts from RKI in Korean are now being jammed (RKI *SW Feedback*)

LEBANON V. of Hope English at 1330 back on 9960 ex-9990 (Nikolay Pashkevich, Russia, *Cumbre DX*) 9990 was wiped out by RTTY interference; due to budget, cut back to 18 hrs per day, lower power, but in Cairo 6280 with 5 kW comes in very nicely daytime; 9960 is 6 kW toward Moscow at night, Sa'udi peninsula and Ethiopia day (Gary Hull, mgr., VOH via Hans Johnson, *Cumbre DX*)

LIBERIA ELWA has no plans to resume SW, but maybe FM; has been 'burned' twice, with transmitter stolen by R. Liberia; also believed that the 50 kW ex-KGEI transmitter has been dismantled and stolen from the ELWA compound (Jennifer Turpin, SIM via Hans Johnson, *Cumbre DX*)

MALAWI MBC off frequency on 5993 at 1512 with English ID (David Norrie, South Africa, *DX Window*) Germany shall withhold funds for Malawi's second radio channel unless Pres. Bakili Muluzi's government amends legislation giving it power to control the existing outlet. Muluzi has never allowed the opposition to use the radio, but wants a second station in six vernaculars to break the dominance of Chichewa (AFP via David Alpert)

NIGERIA Despite lack of any announcements on 15120 music tests, report by fax to VON was verified by fax. Said tests to Eu were 0600-1000, 1500-2000, and would also test on 7225 [sic, really 7255] (Roger Tidy, England, *World*

of Radio) Same no-announcements music tests on 7255 0600-0730+ (Ed Rausch, NJ, Brian Alexander, gh)

PALAU KHBN is looking to replace one of its transmitters which is 30 years old and has run over 158 kilohours. Want to buy a Harris 100 currently stored in SAm for $43.4K. Previous xmtrs were bought from HCJB (Hans Johnson, *Cumbre DX*)

PAPUA NEW GUINEA NBC had a $2M budget cut, had trouble paying staff salaries; the Kalang commercial network faces receivership (R. Australia via BBCM)

PERÚ Reactivation on 5767.2 with new ID as *R. Universal*, ex- R. Estelar, but still in Moyobamba, with a two-hour musical show at 0000, and to be on air in morning from 1000. *R. Melodía*, San Ignacio on 7040.3 until 2302* claiming to be on 7015. *R. Soledad* on 4612.4v ex-4528v at 0020. Audio is crisp and clear for as long as it stays on one given frequency—2 or 3 minutes! *R. Imagen*, Tarapoto, normally 4969.1, heard several afternoons in Dec until 0000* on standby 5144, probably no more than 100 watts, including news at 2330. On 6249.6v, *R. La Voz*, presumably at Andahuaylas, quite strong from 1030, better than at 2300. *R. Melodía*, 7040.3, San Ignacio, announced increase to 2200-0300, also with news at 1150, but doesn't seem to be active weekends (Henrik Klemetz, *Dateline Bogotá* via *DXW*)

R. Victoria, Lima, 5818.8 at 2116-2148, religious program with its *gran cadena* (Pedro F. Arrunátegui, *Chasqui DX*)

R. San Miguel Arcángel, 6339.5 0004-0100+ with dance music, ID at 0037 (Hans Johnson, CO, *Cumbre DX*)

SÃO TOMÉ VOA relay's Asst. Transmitter Plant Supervisor Charles Lewis verified taped report direct, and offers to continue until he leaves in June if volume is not too great. Include US postage SASE for reply via diplomatic pouch, or an IRC or $1 for reply with pretty local stamps: P.O. Box 522 (Jerry Berg, MA, *DXW*) Morning broadcast on 4960 ex-4750, including English 0300-0330, other languages 0500-0530 (M-F -0600) (VOA *Communications World*)

SLOVAKIA RSI is sending out a high quality pennant, and their 1997 calendar is a small piece of art (Harald Kuhl, DSWCI *DX Window*) AWR 2130 on 6055, including *Wavescan* Sundays, dropped due to poor reception in UK, Russian interference (Peter Lee, AWR)

SOUTH AFRICA TWR has lost $30K in donations by mail due to theft. A man in Pretoria was caught opening the mailbags. An audit became necessary. Incoming mail of 300 letters a day dropped to a handful (*Church on Radio* via *BC-DX*)

Channel Africa faces a budget cut at the end of March, but would like to expand beyond a service from Africa to Africa. The two most crucial services are English and Swahili, to be sharpened, as well as improving output via Internet (Hans-Dieter Winkens, interim executive director, on RN*MN* via BBCM)

The SENTECH ex-R. Oranje 100 kW transmitter is idle as it is connected to a 275° log-periodic antenna not much in demand. Plan to relocate it to 5 or 7° toward Zambia, Zimbabwe (Kathy Otto, SENTECH via Piet Conradie, *Cumbre DX*)

Stocks & Funds Network planned to start extensive financial broadcasts from here by Jan 1, 18 hrs daily to Af/ME in local mornings, noon, evenings with 25-minute programs: 0200-0300 on 6195, 7175; 0300-0400 on 9775, 11985; 0400-0800 on 11985, 15225; 0800-1400 on 17735, 21745; 1400-1600 on 17735, 21745; 1600-1700 on 17735; 1800-2200 on 15420, 17890. Satellite-fed from 1733 Clifton Rd. NE, Atlanta, GA 30329; fax 404-315-9523 (RN*MN* via Mick Ogrizek, *EDXP*) *Why choose the poorest continent for brokerage business?-gh* In Africa a million persons are interested in investing (Jerry Hoffman, president, Stox & Funds, RN*MN*)

SPAIN REE is a mess at weekends on 11815, with co-channel usage via Spain and with a satellite delay Costa Rica causing an annoying echo, Sat 1800-2200, Sun 1800-2100 (Colin Miller, Ont., DSWCI *DXW*)

SURINAM R. Apintie, 4990.95, *0727 anthem, EZL vocals //820 (David M. Clark, Nfld. DXpedition)

THAILAND BBC relay planned to use two transmitters to SAs from January; mostly Singapore channels will be replaced (Alok Das Gupta, India, DSWCI *DXW*)

TIBET China is helping improve broadcasting here, including building a MW and SW transmission network, to bring radio coverage area up to 80% (*Renmin Ribao* via BBCM) Lhasa often has remarkable signal, must be new transmitters, often audible by 1300 in late Nov in Tibetan on 6200, 5020, 4820, 4035 (Noël R. Green, England, *Electronic DX Press*)

U A E Dubai heard at 1330 in English on 13665 ex-13675 (Ivan Grishin, Ont., *W.O.R.*)

U K O G B A N I BBC World Service got a 5 megapound increase in funding for 1997-98, so it will not have to drop any languages (Chet Copeland, Chris Hambly, Australia, *W.O.R.*) Will be used to strengthen Mandarin, Arabic, increase WS via FM, Internet. But the 152.4 megapound total is still below last year, and over 100 jobs will be lost (*Broadcast* magazine via Richard Buckby)

U S A Pres. Clinton introduced his appointee as new VOA Director, Evelyn Lieberman, who had been Deputy Chief of Staff at the White House (White House press release via Patrick Crumhorn)

VOA services in Kirundi, Kinyarwanda, expanded from 5 to 7 days a week due to crisis in area, 0400-0430 on 5975 Botswana. 6170 Ascension, 7290 São Tomé (VOA *CW* via BBCM) Opinions about VOA program content may be directed to: <ombudsman@VOA.GOV>. Comments serve as base for VOA's *Ombudsman Report* broadcast periodically in English and other languages (VOA website via BBCM) *When?-gh*

VOA and Justice Department coöperate with *International Crime Alert* weekly broadcast, accompanied by photos of fugitives on USIA home page: **www.usia.gov**(Sa'udi Arabian news agency UPI via Mike Cooper) *Do they say when? Of course not!-gh* A sex-discrimination case against VOA involving 1100 women from 1974 to 1984 could ultimately cost the US government half a billion dollars (Reuter via Mike Cooper, AP via David Alpert) Annual VOA budget is only $100 million (Kim Elliott, VOA)

Digital broadcast tests 2 kHz wide continuous tones at 37.5 kHz intervals between 13434.5 and 14972 at 2000-2100, interfering with stations on the 22mb; via Delano again? (Wolfgang Büschel, Germany) VOA Greenville spurs from 17725 English to Africa at 2007: 17852, 17598 (gh, OK)

KVOH, Los Angeles, spurs from 17775 in Spanish at 2046, plus and minus 145/146 kHz and 2nd, 3rd multiples of that! (gh, OK)

WRMI, 9955, tested in Dec a program from Khmer Community Rescue Association, Seattle, *Voice of Cambodia Radio International* in English Sat 2230-2300 following a half-hour in Cambodian, *Thansour Thmey Radio*. Also began relaying Vatican Radio in Spanish at 0215-0230 UT Tue-Sat, 0145-0200 Sun (Jeff White, WRMI)

Pastor John Osborne announced on WVHA that Prophecy Countdown had been unable to meet loan payments, and Dec. 31 was the deadline to avoid a "foreclosure fire sale." Mainstream Seventh Day Adventists had been offered the station, but not interested. He said three or four buyers were eager to get it, but hoped it would not go to "pagans and Babylonians preaching error" (Jim Moats, gh) We have been selected to broker the sale of WVHA for Prophecy Countdown. The station in Maine has 4x4 slewable curtain antennas covering Scandinavia to the Cape of Good Hope! (George Jacobs & Associates) WVHA value has increased from $5M to $7M; one interested buyer is Bloomberg Information, the financial network which owns WBBR, 1130, New York (Rich McVicar, ME, HCJB *DXPL*) Then WVHA got another extension to end of Jan, and paid half of what was due (gh)

Following up last month's story about Lloyd Gerald Pond, charged with sexual abuse at KTBN shortwave facilities: Pond pleaded guilty to a reduced charge of forcible sexual abuse, a second-degree felony. In exchange, prosecutors agreed to recommend probation and counseling. Sentencing will be Feb. 3. (Jason N. Swensen, *Deseret News*)

WINB expected to return to the air in Jan with Christian music, timeblocks sold (Sally Spiker, WINB, via Hans Johnson, *Cumbre DX*) Re-registered as: 1700-1900 15715, 1900-2200 11740 both 62°, 2200-0300 11950 242° (George Jacobs & Associates via George Thurman)

WORLD OF RADIO changes on WWCR: Sat 1600 ex-1800 on 12160; new UT Sun 0400 on 3215; see our website for the latest (gh) FCC has told licensees to quit registering alternate unused frequencies, and make those chosen propagationally correct for target (George McClintock, WWCR)

[non] TWR founder Dr. Paul E. Freed died Dec. 1 at Cary, NC. Started with 2.5 kW V. of Tangier in 1954; moved to Monaco in 1959, expanded to more than 100 languages from ten stations around the world (Colin Miller, Ont., *BC-DX*)

R. Free Asia added Tibetan Dec. 1, at 2300, repeated at 2330, 1300, 1330 (VOA via BBCM) Tibetan at 2300 found on 7415 and stronger 7550, presumably CIS sites (Nikolay Pashkevich, Russia, *W.O.R.*) At 1300-1400 had tested 11615, but heard with Tibetan on 9440—not KHBI, accounted for on 9355, 13840, maybe KHBN Palau? (gh) No, audio and propagation point to CIS such as Armenia (Wolfgang Büschel)

ZAÏRE [non] R. Agatashya's transmitters and studios in Bukavu were damaged in fighting, off air since Oct. 27. Looking into alternatives, such as SW via Switzerland (Marco Domeniconi, Hirondelle Foundation via Hans Johnson, *Cumbre DX*)

Until the Next, Best of DX and 73 de Glenn!
http://hudson.idt.net/~khecht19/radio/shortwave/ghauser
Material cut from this column is posted on the *MT* web site at **www.grove.net**

Broadcast Loggings

GLOBAL FORUM

Gayle Van Horn

0010 UTC on 9680
THAILAND: Radio Thailand. *Business Report* program, including an invitation to Thai businessmen to visit international business conference in Italy. (Jerry Witham, Keaau, HI) Station noted at 1425-1432 on 4830. Weak with English announcements, interval signal and ID. (Mark Veldhuis, Netherlands via email/*Hard-Core DX*) Station noted on 11805 at 2036 with news; 11905 at 0054. (Gerald R. Brookman, Kenai, AK)

0045 UTC on 7325
AUSTRIA: Radio Austria Int'l. *Profile of Austria* featuring artist Wilhelm Kaufman. (Bob Fraser, Cohasset, MA; Brookman, AK)

0111 UTC on 3230
SOUTH AFRICA: Radio Oranje. (Tent) Pop music program to announcer's English comments. (Lee Silvi, Mentor, OH via email) South Africa's Channel Africa noted on 4875 at 1705. Regional news to interview on U.S. investments in South Africa. Fade out by 1730. (Daniel Hill, Anchorage, AK via Keaau, HI)

0204 UTC on 9755
CANADA: Radio Canada Int'l. News bulletin at tune-in. *Spectrum* at 0210, with report on AIDS conference and medical ethics, // 6155, 9535, 11725. Fair signal quality. (Jim Moats, Ravenna, OH) Canada's CBC-Vancouver noted on 6160-0231. (Brookman, AK)

0233 UTC on 4635
TAJIKISTAN: Radio Dushanbe.Very weak garbled audio in unknown dialect. Station heard with same quality at 1200. (James DeYoung, Arlington, VA via email)

0244 UTC on 4820
BOTSWANA: Radio Botswana. Distinctive bells and farm animal interval signal to 0300. Sign on ID to vernacular/English religious text to American religious hymns. (Silvi, OH)

0312 UTC on 7105
ASCENSION ISLAND: VOA relay. *Daybreak Africa* show, with reports on African politics, food conference and sports update. Parallel noted on 7340, 7415, 9575 with fair to poor signal quality. BBC relay noted on 15400, // 15420 at 1806. (Moats, OH)

0405 UTC on 12008 USB
SUDAN: Nat'l Broadcasting Corp. Arabic. Male announcer's talk to regional music at 0410. Discussion of two males about Sudan. Signal weak on // 8000. (Witham, HI)

0420 UTC on 4914.7
PERU: Radio Cora. Spanish. Fast paced Spanish vocals to "Cora" ID and time check. Ecuador's Radio Quito causing interference. Ads, chat, sign-off ID at 0500. (Frank Hillton, Charleston, SC)

0530 UTC on 4890
GABON: Radio France Int'l relay. French broadcast to Africa. Good signal in Ohio. Gabon's RTV Gabonaise noted at 2202-2258 on 4777. (Silvi, OH)

0715 UTC on 11905
NEW ZEALAND: Radio NZ Int'l. *The World of Sports* including interview and report on an upcoming cricket match of New Zealand vs Pakistan. Interview at 0740 with the new governor of American Samoa. (Witham, HI)

0725 UTC on 4985
BRAZIL: Radio Brazil Central. Portuguese. Brazilian pops to station ID. Fast paced DJ's chatter to local ads. (Hilton, SC) Brazil's Radio Bandeirantes heard on 11925, 2044-2057. Elton John music, ads, sports news to ID. (SIO=444). (Veldhuis, Netherlands) Brazil's **Radio Guaruja** heard on 5980 at 1231-1230. (Silvi, OH)

0750 UTC on 11885
INDONESIA: RRI Jakarta. Indonesian. Indoor sporting event between two contestants, with lively audience response. (Witham, HI) Indo's **RRI-Tanjung Karang** heard on 3395 at 2237-2302. Short music bridges, *Song of the Coconut Island* interval signal, ID and news. (Veldhuis, Netherlands)

1150 UTC on 5407.33
ASIAN CLANDESTINE: Radio Provisional Government, South Laos. Good carrier, echo effect audio, not much readable. Asian music to male/female announcers talk. Top of the hour announcement as possible ID? Noted signal on multiple mornings. (DeYoung, VA)

1412 UTC on 11402
ICELAND: Rikisutvarpid. Presumed news in Icelandic, // 13860. Station noted also at 1945-2006 barely audible. (Silva, OH)

1413 UTC on 5005
NEPAL: Radio Nepal. Regional Nepalese music to vernacular chat. Four tone interval signal to ID and news. SINPO=24333. (Veldhuis, Netherlands)

1423 UTC on 9750
MALAYSIA: Voice of Malaysia. (Tent) Indonesian text for news format. Malaysia and Kuala Lumpur mentioned often including a tentative ID. SINPO=43444. (Veldhuis, Netherlands)

1615 UTC on 11840
NORWAY: Radio Norway Int'l. Feature on children's authors. **Radio Denmark** relay noted at 1645 on 11840, with *Walk About Denmark* show featuring the Little Mermaid Statue. (Fraser, MA)

1710 UTC on 9890
RUSSIA: Voice of Russia. Poor signal for *Moscow Mailbag* covering subways and religion in Russia today. (Fraser, MA) VOR noted on 9550 at 1806. (Moats, OH)

1715 UTC on 6440
NORTH KOREA: Radio Pyongyang. (Tent) Presumed Arabic for monologue on North Korea. Rousing nationalistic program segment to 1720. (Hill, HI) Station monitored as; 2040-9345, 2046-9975; 2343-13650// 11700. Brookman, AK)

1720 UTC on 9615
AUSTRALIA: Radio Australia. Pop music tune *I'm Not in Love* to station feature, heard on // 12080, 11880. (Peter B. Haishun, Hurst, TX)

1750 UTC on 6854 USB
SOMALIA: Voice of the Somalian People (Tent). Presumed Somalian. Male's monologue to brief message from female announcer. Tribal music accompanied by children's chorus. (Witham, HI)

1800 UTC on 11830
JORDAN: Radio Jordan. Station ID to Arabic promos for music program. (Howard Moser, Lincolnshire, IL)

1810 UTC on 5965
KENYA: Trans World Radio. Lite music interspersed with religious messages in English and African vernacular. Station ID as, "This is Trans World Radio, Nairobi, Kenya." Religious programming format to 1830 and final fade out. (Witham, HI)

1900 UTC on 15135
RWANDA: Deutsche Welle relay. Station ID followed by *Newsline Cologne* program with headlines and report on Zaire refugee crisis, // 11810. (Fair to good signal quality. (Moats, OH) Noted on 17860-1950 in German. Edward H. Schwartz, Chicago, IL)

1909 UTC on 11975
SAO TOME: VOA relay. News bulletin at tune-in followed by *Newsline* at 1910. Parallel 13710, 15410, 15580-fair to poor signal. (Moats, OH)

1925 UTC on 9705
MADAGASCAR: Radio Netherlands relay. *Dutch Dairies* program including interview with prison guard. (Fraser, MA) Station noted at 1830 on 9605, // 11655, 15315 with report on Columbia's civil war. (Moats, OH)

1930 UTC on 9745
MONGOLIA: Radio Ulan Bator. English interview with tourist who was enthusiastic about the landscape beauty of Mongolia. (Witham, HI) National news heard on 9745-1956. (Brookman, AK)

1945 UTC on 17870
SPAIN: Radio Exterior Espana. Play-by-play soccer commentary in Spanish. (Schwartz, IL)

2010 UTC on 7335
BULGARIA: Radio Bulgaria. Report on the International Monetary Fund to establish a Currency Board in Bulgaria, to curb the runaway inflation. (Fraser, MA) Station noted on 9485 at 0533. (Brookman, AK)

2100 UTC on 2100
ECUADOR: HCJB. Religious show, *The Haven Program,* with fair signal quality. (Fraser, MA)

2100 UTC on 13715
CUBA: Radio Havana. News commentary on the European Union bringing the U.S. Helms-Berg (anti-Cuban trade) Law to the World Court. (Fraser, MA) *Top 10* song countdown Monday, 0130-0200 on 9820// 9830 USB. Great chance to hear Cuban music program. (Silvi, OH; Brookman, AK)

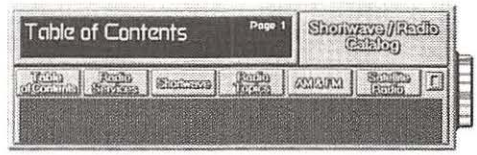
2205 UTC on 9825
JAPAN: Radio Japan. World news followed at 2210 by *Top News From Asia and the Pacific*, including a report on AIDS prevention and news of pending law suits for Honolulu's lack of handicap facilities. (Witham, HI)

2345 UTC on 4815
BURKINA FASO: Radio Burkina. French programming to 0011. Strong signal for African music, chat and news/commentary. (Silvi, OH)

Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times (or e-mail gayle@grove.net)*
English broadcast unless otherwise noted.

Gayle Van Horn, gayle@grove.net

The Best of the Best



Are you still looking for website links that are radio related? The absolute best radio site in cyberspace is Pete Costello's *Shortwave/Radio Catalog* **<itre.ncsu.edu/radio/>**. Included are links to radio services, shortwave, radio topics, AM/FM and satellite radio. Anything radio related is at Pete's place!

If a web source for utility DXing is what you've been lacking, Larry Van Horn's Utility World is now online! **<http://www.grove.net/~larry/uteworld.html>**. Pages include High in the Sky (civilian HF aviation), Military HF Intercept Center, HF on the High Seas, Satellite/Space Center, Ute World Web Resources, and much more!

Need utility addresses for reception reports? Welcome to QSL Center OnLine! Available through the Utility World site (above), QSL addresses include airlines, cruise ships, ship companies, and fixed stations, just for starters. I plan on providing some interesting background material on how to QSL a utility station, do's and don'ts, multilingual reception report forms, and much more.

So why don't you join Pete and the Van Horns on the information super highway, today!

AIRCRAFT TRAFFIC

P2-MBL-De Havilland DHC-6 Twin Otter, 6622 kHz USB. Full data prepared QSL card returned as verified. Received in 35 days for an English utility report of air traffic of plane departing Port Moresby enroute Nadzab. QSL address: MBA Pty, P. Lipanovich-Chief Pilot, Jacksons Airport Port Moresby, P.O. Box 170, Boroko, NCD, Papua New Guinea. (Steve McDonald-VE7SL, Mayne Island, BC Canada/*World Utility News* via email)

P2-MBZ-Beechcraft Super King Air 200, 6622 kHz USB. Full data prepared QSL card returned as verified plus personal letter from Chief Pilot. Received in 35 days for air traffic enroute Port Moresby-Moro. QSL address: MBA Pty Ltd., P. Lipanovich-Chief Pilot, Jacksons Airport Port Moresby, P.O. Box 170, Boroko, NCD, Papua New Guinea. (McDonald, CAN)

C-GHPW 5680-Lockheed L-382G Hercules, 5680 kHz USB. Full data prepared QSL card returned as verified by Larry Pinto-Director Flight Ops. Received in 18 days for air traffic from Koala-Yellowknife/flight operating as Territorial 701. QSL address: NWT Air, Postal Service 9000, Yellowknife, NWT X1A 2R3 Canada. (McDonald, CAN)

VH-TJB 5643-Boeing 737-300, 5643 kHz USB. Full data prepared QSL card returned as verified by Tony Rogan-Flight Ops. Color photo of aircraft and personal letter enclosed. Received in 30 days for an English utility report of air traffic operating 175 miles south of Port Villa enroute Auckland-Vila-Honiara. QSL address: Solomon Airlines, Box 46, Brisbane Int'l Terminal, Eagle Farm, QLD, Australia 4007. (McDonald, CAN)

CANADA

Radio Canada International, 15325 kHz. Full data RCI card signed by Bill Westenhaven. RCI's programming schedule, plastic station pennant and station letter enclosed. Received in 15 days for an English report. Station address: P.O. Box 6000, Montreal, Canada H3C 3AB. (Richard Barnes, via email)

COASTAL STATIONS

KFS/Globe Wireless, Palo Alto Radio, CA, 8558 kHz. Partial data station logo QSL card with illegible signature. Received in 20 days for an English utility report. Station address: c/o Globe Wireless, Engineering Dept., One Meyn Rd., Half Moon Bay, CA 94019. (Darren R. White, Hattiesburg, MS)

NMK4-Barnegat Light Station, New Jersey, 156.8 kHz USB. Full data prepared QSL card returned as verified from William G. Dages-WA2VSQ. Received for an English utility report and mint stamps. Station address: Barnegat Light, NJ 08006-9999. (Hank Holbrook, Dunkirk, MD)

DENMARK

Radio Denmark, 15340 kHz. Partial data station logo card signed by Liselotte Samsoe. Received in two months for an English report and one IRC. Station address: Rosenorns Alle 22, DK-1999 Frederiksberg C, Denmark. (Gayle VH, Brasstown, NC) email: *rdk@dr.dk*. For technical matters or reports go to WWW: **<http://www.dr.dk>** and **<http://www.aau.dk/rdk/>**

MEDIUM WAVE

CFRB, 1010 kHz AM. Full data station logo card, form letter and ODXA flyer signed by Steve Cannery-VA3ID for ODXA. Received in 14 days for an AM report and one U.S. dollar. QSL address: c/o Ontario DX Association, P.O. Box 161, Station A, Willowdale, ON M2N 5S8 Canada. (Randy Stewart, Springfield, MO)

WSB, 750 AM kHz. Full data station form letter signed by Greg Moceri-Program Director. Received in 12 days for an AM report and mint stamps. Station address: 601 Peachtree St., Atlanta, GA 30309. (Stewart, MO) Check out WSB's website at: **<http://www.mindspring.com/~wsb/wsbhome.html>**. For late night entertainment from Atlanta's number one talk show host, check out the rebroadcasts of Neal Boortz's morning talk show. *ReBoortz* can be heard on 750AM from 11:00pm-2:00am EST. -ed.

SHIP TRAFFIC

USNS Comfort (T-AH 20) NCOM, 156.65/156.6 MHz USB (Naval Hospital Ship). Full data prepared QSL card returned as verified by Supply Officer, plus Welcome Aboard pamphlet. (Ship served in Desert Storm) Received for an English utility report and mint stamps. Ship address: 4209 Newgate Ave., Canton Pier 11, Baltimore, MD 21224. (Holbrook, MD)

Miss Barnegat Light (WYS 7736) 156.8/157.1 MHz USB (Fishing Vessel). Full data prepared QSL card returned as verified, plus rate card and colorful photo of vessel. Received for an English utility report and mint stamps. Ship address: 16 East 12th St., Barnegat Light, NJ 08006. (Holbrook, MD)

Meridian (C6IP3) 156.65/156.6 MHz USB (Passenger Vessel). Full data prepared QSL card returned as verified. Received for an English utility report and mint stamps. Ship address: Celebrity Cruises, 5201 Blue Lagoon Dr., Miami, FL 33126. (Holbrook, MD)

Eastern Steamer (P3KS3) 156.7 MHz USB (General Cargo). Full data QSL letter received for an English utility report and one U.S. dollar. Ship address: Intership Navigation Co., Ltd., P.O. Box 4393, Limassol, Cyprus. (Holbrook, MD)

MSC Stefania (3EVI6) 156.7 MHz USB (Container Ship). Full data prepared QSL card returned as verified. Received for an English utility report and one U.S. dollar. Ship address: Mediterranean Shipping Co., SA-18 Chiem Rieu, CH-1200, Geneva, Switzerland. (Holbrook, MD)

USA

Radio Noodle International, 9955 kHz via WRMI transmitters. Full data QSL letter # 12 signed by Jammin' Jan for their premier broadcast on shortwave. Received in 7 days for an English AM report and mint stamps. Station address: P.O. Box 5617, Ventura, CA 93005. Interesting she taped a piece of spaghetti across the top of the letter! (John Hanz, Old Bridge, NJ)

ZAMBIA

Radio Christian Voice, 3335 kHz. Full data QSL letter signed by B. Pairi. Received in six weeks for an English report. Station address: Private Bag E606, Lusaka, Zambia. (Fredrick Lehmkuehler, Wertheim am Main, Germany/via email).

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5,6,7, or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (7:30 pm Eastern, 4:30 pm Pacific).

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am:	The Americas	as:	Asia
na:	North America	au:	Australia
ca:	Central America	pa:	Pacific
sa:	South America	va:	various
eu:	Europe	do:	domestic broadcast
af:	Africa	om:	omnidirectional
me:	Middle East		

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Radio Programs

Programming Tips by Jim Frimmel

Sundays

0031 Spain, REE: "Distance Unknown"
0109 HCJB (am): "DX Partyline"
0131 Spain, REE: "Distance Unknown"
0200 Radio For Peace Intl: "World of Radio"
0234 Radio Havana Cuba: "DXers Unlimited"
0249 Radio Romania Intl: "DX Mailbag"
0258 Vatican Radio: "On-the-Air"
0300 WWCR #3 (Tennessee): "Spectrum"
0400 WGTG (Georgia): "North of 49"
0400 AWR-Europe (Slovakia): "Wavescan"
0400 WWCR #1: "World of Radio"
0409 HCJB (am): "DX Partyline"
0410 Australia, Radio: "Feedback"
0415 Voice of Turkey: "DX Corner (biweekly)"
0430 WHRI (Angel 2): "DXing with Cumbre"
0430 Australia, Radio: "The Media Report"
0434 Radio Havana Cuba: "DXers Unlimited"
0525 Radio Japan: "Media Roundup"
0530 AWR Europe (Slovakia): "Wavescan"
0531 Spain, REE: "Distance Unknown"
0608 Vatican Radio: "On-the-Air"
0610 Australia, Radio: "Feedback"
0634 Radio Havana Cuba: "DXers Unlimited"
0725 Radio Japan: "Media Roundup"
0735 Radio Vlaanderen Intl: "Radio World"
0830 Radio Korea: "Shortwave Feedback"
0900 Radio For Peace Intl: "World of Radio"
0910 Australia, Radio: "Feedback"
1000 WWCR #1: "World of Radio"
1100 AWR Latin America: "Wavescan"
1140 Radio Korea: "Shortwave Feedback"
1230 Radio Korea: "Shortwave Feedback"
1240 Radio Korea: "Shortwave Feedback"
1335 Radio Vlaanderen Intl: "Radio World"
1345 WRMI (Florida): "Wavescan"
1352 Vatican Radio: "On-the-Air"
1425 Radio Japan: "Media Roundup"
1630 Radio Korea: "Shortwave Feedback"
1725 Radio Japan: "Media Roundup"
1730 WHRI (Angel 2): "DXing with Cumbre"
1830 KWHR (Hawaii): "DXing with Cumbre"
1905 Radio Vlaanderen Intl: "Radio World"
1930 Radio Korea: "Shortwave Feedback"
1930 Australia, Radio: "The Media Report"
1940 Radio Korea: "Shortwave Feedback"
2010 Radio Korea: "Shortwave Feedback"
2125 Radio Japan: "Media Roundup"
2130 Radio Korea: "Shortwave Feedback"
2131 AWR-Europe (Slovakia): "Wavescan"
2205 Radio Vlaanderen Intl: "Radio World"
2213 R Budapest Intl: "R Budapest DX Show"
2215 AWR-Europe (Slovakia): "Wavescan"
2245 Radio Bulgaria: "Radio Bulgaria Calling"
2300 WHRI (Angel 2): "DXing with Cumbre"
2300 AWR Latin America: "Wavescan"
2300 KSDA (Guam): "Wavescan"
2300 Radio For Peace Intl: "World of Radio"
2305 WWCR #3: "Ham Radio and More"
2325 Radio Japan: "Media Roundup"
2330 Radio Canada Intl: "Now the Details"

Mondays

0015 WWCR #3: "Ask WWCR"
0030 WWCR #3: "World of Radio"
0035 Radio Vlaanderen Intl: "Radio World"
0100 WGTG: "The Domestic SW Report"
0125 Radio Japan: "Media Roundup"
0200 WRMI (Florida): "Wavescan"
0230 Radio Korea: "Shortwave Feedback"
0330 KWHR (Hawaii): "DXing with Cumbre"
0331 Radio Canada Intl: "Now the Details"
0343 R Budapest Intl: "R Budapest DX Show"
0430 Radio New Zealand Intl: "Mailbox (biweekly)"
0545 Radio Bulgaria: "Radio Bulgaria Calling"
0600 WWCR #3: "Ask WWCR"
0700 Radio For Peace Intl: "World of Radio"
0905 WWCR #1 (Tennessee): "Spectrum"
1005 WWCR #1: "Ham Radio and More"
1040 All India Radio: "DX-ers Corner (2/4)"
1215 Radio Bulgaria: "Radio Bulgaria Calling"
1350 R Romania Intl: "For Radio Amateurs"
1435 All India Radio: "DX-ers Corner (2/4)"
1520 R Romania Intl: "For Radio Amateurs"
1615 KTWR (Guam): "Pacific DX Report"
1840 All India Radio: "DX-ers Corner (2/4)"
1915 R Tallinn: "Radio Estonia DX Program"
1920 AWR Latin America: "Wavescan"
1950 R Romania Intl: "For Radio Amateurs"
2130 All India Radio: "DX-ers Corner (2/4)"
2145 Radio Dnestr: "DX Herald (3)"
2150 R Romania Intl: "For Radio Amateurs"
2230 WRMI (Florida): "Wavescan"
2345 WRMI (Florida): "Wavescan"
2350 R Romania Intl: "For Radio Amateurs"

Tuesdays

0255 R Romania Intl: "For Radio Amateurs"
0900 KTWR (Guam): "Pacific DX Report"
1210 AWR Latin America: "Wavescan"
1246 Radio Sweden: "MediaScan (1/3)"
1330 WWCR #1: "World of Radio"
1346 Radio Sweden: "MediaScan (1/3)"
1455 FEBC (Philippines): "DX Dial"
1900 Radio For Peace Intl: "World of Radio"
1946 Radio Sweden: "MediaScan (1/3)"
2046 Radio Sweden: "MediaScan (1/3)"
2050 Polish Radio: "Polish Radio DX Club"
2139 Radio Havana Cuba: "DXers Unlimited"
2230 WRMI (Florida): "Wavescan"
2239 Radio Havana Cuba: "DXers Unlimited"
2246 Radio Sweden: "MediaScan (1/3)"
2340 All India Radio: "DX-ers Corner (2/4)"
2345 WRMI ("orida): "Wavescan"

Wednesdays

0046 Radio Sweden: "MediaScan (1/3)"
0135 Radio Havana Cuba: "DXers Unlimited"
0146 Radio Sweden: "MediaScan (1/3)"
0246 Radio Sweden: "MediaScan (1/3)"
0300 Radio For Peace Intl: "World of Radio"
0335 Radio Havana Cuba: "DXers Unlimited"
0346 Radio Sweden: "MediaScan (1/3)"
0535 Radio Havana Cuba: "DXers Unlimited"
0800 HCJB (eu): "Ham Radio Today"
0930 HCJB (pac): "Ham Radio Today"
1000 Radio For Peace Intl: "World of Radio"
1230 WWCR #1: "World of Radio"
1315 FEBC (Philippines): "DX Dial"
1820 Polish Radio: "Polish Radio DX Club"
1920 Argentina, RAE: "DX'ers Special"
1930 HCJB (eu): "Ham Radio Today"
2015 R Budapest Intl: "R Budapest DX Show"
2230 WRMI (Florida): "Wavescan"
2345 WRMI (Florida): "Wavescan"

Thursdays

0130 HCJB (am): "Ham Radio Today"
0215 R Budapest Intl: "R Budapest DX Show"
0235 Argentina, RAE: "DX'ers Special"
0430 HCJB (am): "Ham Radio Today"
0754 Radio Netherlands Intl: "Media Network"
0830 R New Zealand: "Mailbox (biweekly)"
0953 Radio Netherlands Intl: "Media Network"
1153 Radio Netherlands Intl: "Media Network"
1320 Polish Radio: "Polish Radio DX Club"
1352 Radio Netherlands Intl: "Media Network"
1553 Radio Netherlands Intl: "Media Network"
1753 Radio Netherlands Intl: "Media Network"
1952 Radio Netherlands Intl: "Media Network"
2130 WWCR #1: "World of Radio"
2230 WRMI (Florida): "Wavescan"
2345 WRMI (Florida): "Wavescan"

Fridays

0053 Radio Netherlands Intl: "Media Network"
0253 Radio Netherlands Intl: "Media Network"
0453 Radio Netherlands Intl: "Media Network"
1446 Radio Portugal Intl: "Radio Portugal DX (triweekly)"
1930 R New Zealand: "Mailbox (biweekly)"
1930 AWR Latin America: "Wavescan"
2000 Radio For Peace Intl: "World of Radio"
2042 Radio Bulgaria: "Radio Bulgaria Calling"
2100 WWCR #1 (Tennessee): "Ask WWCR"
2116 Radio Portugal Intl: "Radio Portugal DX (triweekly)"
2210 Australia, Radio: "Feedback"
2230 WRMI (Florida): "Wavescan"
2330 WHRI (Angel 2): "DXing with Cumbre"
2345 WRMI (Florida): "Wavescan"

Saturdays

0010 Australia, Radio: "Feedback"
0045 Radio Bulgaria: "Radio Bulgaria Calling"
0200 KWHR (Hawaii): "DXing with Cumbre"
0400 Radio For Peace Intl: "World of Radio"
0446 Radio Portugal Intl: "Radio Portugal DX (triweekly)"
0500 KWHR (Hawaii): "DXing with Cumbre"
0600 WHRI (Angel 1): "DXing with Cumbre"
0600 WHRI (Angel 2): "DXing with Cumbre"
0740 HCJB (eu): "DX Partyline"
0800 HCJB (eu): "DX Partyline"
0909 HCJB (pac): "DX Partyline"

(Continued on page 45)

Frequencies

0000-0030	Australia, Radio	13605pa	15510as	17750as	
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	7375na	9485na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFCX Montreal	6005do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0100	Canada, R Canada Intl	5960am	9755am		
0000-0030	Canada, R Canada Intl	6040am	9535am	11940am	
0000-0100	China, China Radio Intl	9710na	11695na		
0000-0100 vl	Costa Rica, Adv World R	7375am	9725am	13750am	15460am
0000-0100	Costa Rica,RF Peace Intl	6205am			
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0100	Ecuador, HCJB	9745am	21455am		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0015 vl	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0045	India, All India Radio	7150as	9705as	9950as	11620as
0000-0100	Lebanon, Voice of Hope	9960va			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0100	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	15115pa			
0000-0050	North Korea, R Pyongyang	11335na	13760na	15130na	
0000-0100 vl	Papua New Guinea, NBC	9675do			
0000-0100	Russia,Voice of Russia WS	5940na	7105eu	7125na	7180na
0000-0100	Spain, R Exterior Espana	6055am			
0000-0030	Thailand, Radio	9680af			
0000-0100	Ukraine, R Ukraine Intl	5905eu	5940eu	6010eu	6020eu
		7180na	7205eu	7290eu	
0000-0100	United Kingdom, BBC WS	5965as	5970am	5975am	6175am
		6195as	9410as	9515am	9590am
		9915am	11750sa	11955as	15280as
		15360as			
0000-0030	United Kingdom, BBC WS	7110as	9580as	11945as	
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0100	USA, KTBN Salt Lk City UT	7510am			
0000-0100	USA, KWHR Naalehu HI	17510as			
0000-0100	USA, Monitor Radio Intl	7535na	9430sa	13840as	
0000-0100	USA, Voice of America	7215as	9890as	11760as	15290am
		17735am	17820as		
0000-0100 twhfa	USA, Voice of America	5995am	6130am	7405am	9455am
		9775am	13740am		
0000-0100	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0000-0100	USA, WGTG McCaysville GA	5085am			
0000-0100	USA, WHRI Noblesville IN	5745am	7315am		
0000-0100	USA, WJCR Upton KY	7490na			
0000-0100 mtwhf	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0100 mtwhf	USA, WVHA Greenbush ME	9900af			
0000-0100	USA, WWCR Nashville TN	3215am	5070am	5935am	
0000-0045	USA, WYFR Okeechobee FL	6085na	11855ca		
0030-0100	Australia, Radio	9660pa	11640as	12080pa	13605pa
		13755pa	15365pa	17715as	17750as
		17795pa	17860pa		
0030-0055	Austria, R Austria Intl	7325na			
0030-0055	Belgium, R Vlaanderen Int	5900na	9925sa		
0030-0055	Belgium, R Vlaanderen Int	5900am	9925am		
0030-0100	Iran, VOIRI	6050na	9022na	9685na	
0030-0100	Lithuania, Radio Vilnius	5890na	6120na		
0030-0100	Netherlands, Radio	5905as	7305as		
0030-0100	Sri Lanka, Sri Lanka BC	9730as			
0030-0100	Sweden, Radio	6065am			
0030-0100	Thailand, Radio	9655as	11905as		
0035-0040	India, All India Radio	4860do	7110do	11830do	11870do
0050-0100	Italy, RAI Intl	6010na	9675na	11800na	

Selected Programs

Sundays

0000 Czech Rep, Radio Prague: News. World news summary.
0000 Ecuador, HCJB Quito (am): Adventures in Odyssey. Lively childrens' dramas from the "Focus on the Family" team.
0005 Czech Rep, Radio Prague: Live in Prague. Jazz from one of Prague's night spots.
0030 Ecuador, HCJB Quito (am): Musical Mailbag. HCJB staffers have a good time reading listener letters and playing music.

Mondays

0000 Czech Rep, Radio Prague: News. See S 0000.
0000 Ecuador, HCJB Quito (am): Joni and Friends. Joni Erickson-Tada presents help and advice especially for the disabled. (www.netchurch.com/jaf/outreach/radio/radschd.htm)
0004 Czech Rep, Radio Prague: The Week in Politics. See S 1134.
0005 Ecuador, HCJB Quito (am): Hour of Decision. Evangelist Billy Graham's radio program.
0013 Czech Rep, Radio Prague: From the Weeklies. See S 1143.
0019 Czech Rep, Radio Prague: Media Check. See S 1149.
0030 Ecuador, HCJB Quito (am): Mountain Meditations. See S 1330.

Tuesdays

0000 Czech Rep, Radio Prague: News. See S 0000.
0000 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
0005 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0008 Czech Rep, Radio Prague: Press Review. See M 1138.
0011 Czech Rep, Radio Prague: Magazine '96. See M 1141.
0030 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.

Wednesdays

0000 Czech Rep, Radio Prague: News. See S 0000.
0000 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
0005 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0011 Czech Rep, Radio Prague: Talking Point. See T 1141.
0023 Czech Rep, Radio Prague: Media Check. See S 1149.
0030 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.

Thursdays

0000 Czech Rep, Radio Prague: News. See S 0000.
0000 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
0005 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0012 Czech Rep, Radio Prague: Press Review. See M 1138.
0013 Czech Rep, Radio Prague: From the Archives. See W 1141.
0021 Czech Rep, Radio Prague: The Arts. See W 1148.
0030 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.
0054 Radio Netherlands: Documentary. Childless by Choice (20th). See F 1454.
0054 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (6th). See W 1254.
0054 Radio Netherlands: Documentary. Spanish Catholicism in Flux (27th). See F 2354.
0054 Radio Netherlands: Documentary. The Titanic: Encore (13th). See A 2354.

Fridays

0000 Czech Rep, Radio Prague: News. See S 0000.
0000 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
0006 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0012 Czech Rep, Radio Prague: Press Review. See M 1138.
0014 Czech Rep, Radio Prague: Economic Report. See H 1144.
0020 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1150.
0030 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.

Saturdays

0000 Czech Rep, Radio Prague: News. See S 0000.
0000 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
0006 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0009 Czech Rep, Radio Prague: Press Review. See M 1138.
0012 Czech Rep, Radio Prague: Between You and Us. See F 1112.
0030 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.

Weblink

Many independently produced radio programs now have representation on the worldwide web. This is especially true of religious broadcasters. Beginning this month, *MT* will include a URL address for those selected programs which have websites, where known. (See Ecuador.)

Hauser's Highlights
HUNGARY: R. Budapest

Music show rotatation:
Mon 2000 (UT Tue 0200):
Week 1: *Peter and Pop*
Week 2: *Kata Chooses Folk*
Week 3: *Bálint and the CD*
Week 4: *Take One*
Listener Feedback ...*And the Gatepost*
4th Tue 2000
Wed 0200
(RB website via gh)

Frequencies

0100-0200	Australia, Radio	9660pa	11640as	13755pa	15240pa
		15365pa	15415as	15510as	17715as
		17750pa	17795pa	17880pa	
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200 vl	Canada, CBC N Quebec Svc	9625do			
0100-0200	Canada, CFCX Montreal	6005do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na	
0100-0127	Czech Rep, Radio Prague	6200na	7345na		
0100-0200	Ecuador, HCJB	9745am	21455am		
0100-0150	Germany, Deutsche Welle	5960na	6040na	6085na	6145na
		9640na			
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do		
0100-0200	Indonesia, Voice of	9525na			
0100-0128	Iran, VOIRI	6050na	9022na		
0100-0200 t	Ireland,W Coast R Ireland	5910am			
0100-0110	Italy, RAI Intl	6010na	9675na	11800na	
0100-0200	Japan, R Japan/NHK World	11790as	11840as	11860as	11890na
		13630am	13650as	15475as	17685as
		17810as			
0100-0130	Kazakhstan, R Almaty	6230eu			
0100-0200	Lebanon, Voice of Hope	9960va			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0125	Netherlands, Radio	6020na	6165na		
0100-0200	Netherlands, Radio	5905as	7305as		
0100-0200	New Zealand, R NZ Intl	15115pa			
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0200	Russia,Voice of Russia WS	7105na	7125na	7240na	9550na
0100-0130	Slovakia, R Slovakia Intl	5930na	7300na	9440na	
0100-0200	Spain, R Exterior Espana	6055am			
0100-0200	Sri Lanka, Sri Lanka BC	9730as			
0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	
0100-0200	Ukraine, R Ukraine Intl	7150na	7160na	7180na	7205na
		7290na			
0100-0200	United Kingdom, BBC WS	5965as	5970sa	5975am	6175am
		6195as	9410as	9515am	9590am
		9915am	11750am	11955as	15280as
		15360as			
0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KWHR Naalehu HI	17510au			
0100-0200	USA, Monitor Radio Intl	7535na	9430am		
0100-0200	USA, Voice of America	7115as	7205as	9455am	9740as
		11705as	15250as	15370as	17740as
		21550as			
0100-0200 twhfa	USA, Voice of America	5995am	6130am	7405am	9775am
		13740am			
0100-0200	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0100-0200	USA, WGTG McCaysville GA	5085am			
0100-0200	USA, WHRI Noblesville IN	5745am	7315am		
0100-0200	USA, WJCR Upton KY	7490na			
0100-0200 mtwhf	USA, WRMI/R Miami Intl	9955am			
0100-0130 s	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0200	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na		
0100-0130	Uzbekistan, R Tashkent	5040eu	5955eu		
0100-0126	Vietnam, Voice of	5940na			
0100-0130 mtwhfa	Yugoslavia, Radio	6195na	7115na		
0115-0130 f	Greece, Voice of	6125na	7450na	9420na	
0130-0150	Greece, Voice of	6125na	7450na	9420na	
0130-0200 s/vl	Malta, VO Mediterranean	15550as	17570au		
0130-0200	Netherlands, Radio	9860as	11655as		
0130-0200	Sweden, Radio	7265am	7290am		
0130-0156	Vietnam, Voice of	5940na			
0140-0200	Vatican State, Vatican R	5980as	7335as		
0145-0200	Albania, R Tirana Intl	6115na	7160na		
0150-0200	Germany, Deutsche Welle	5960na	6085na		

Selected Programs

Sundays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): News. A summary of world and regional news.
0105 Czech Rep, Radio Prague: Live in Prague. See S 0005.
0109 Ecuador, HCJB Quito (am): DX Partyline. Rich McVicar and Karen Schmidt share 50 minutes of DXing updates.

Mondays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): Latin and International News. See S 0400.
0104 Czech Rep, Radio Prague: The Week in Politics. See S 1134.
0109 Ecuador, HCJB Quito (am): Saludos Amigos. An international friendship program with listener contributions.
0113 Czech Rep, Radio Prague: From the Weeklies. See S 1143.
0119 Czech Rep, Radio Prague: Media Check. See S 1149.

Tuesdays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): News. See S 0100.
0105 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0108 Czech Rep, Radio Prague: Press Review. See M 1138.
0110 Ecuador, HCJB Quito (am): Studio 9. Features and interviews with Ralph Kurtenback and Curt Cole.
0111 Czech Rep, Radio Prague: Magazine '96. See M 1141.
0130 Ecuador, HCJB Quito (am): You Should Know. A contemporary view of issues and ethics with Leonard Kinzel.

Wednesdays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): News. See S 0100.
0104 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0110 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0111 Czech Rep, Radio Prague: Talking Point. See T 1141.
0123 Czech Rep, Radio Prague: Media Check. See S 1149.
0130 Ecuador, HCJB Quito (am): El Mundo Futuro. The world of science and technology and a "Computer Corner" segment.

Thursdays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): News. See S 0100.
0105 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0108 Czech Rep, Radio Prague: Press Review. See M 1138.
0110 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0111 Czech Rep, Radio Prague: From the Archives. See W 1141.
0118 Czech Rep, Radio Prague: The Arts. See W 1148.
0130 Ecuador, HCJB Quito (am): Ham Radio Today. John Beck with features, tips, news, and helps for radio amateurs.

Fridays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): News. See S 0100.
0106 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0110 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0112 Czech Rep, Radio Prague: Press Review. See M 1138.
0114 Czech Rep, Radio Prague: Economic Report. See H 1144.
0120 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1150.
0130 Ecuador, HCJB Quito (am): Woman to Woman. Focus on topics of concern.

Saturdays

0100 Czech Rep, Radio Prague: News. See S 0000.
0100 Ecuador, HCJB Quito (am): Latin and International News. See S 0400.
0106 Czech Rep, Radio Prague: Current Affairs. See M 1135.
0109 Czech Rep, Radio Prague: Press Review. See M 1138.
0110 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0112 Czech Rep, Radio Prague: Between You and Us. See F 1112.
0130 Ecuador, HCJB Quito (am): Musica del Ecuador. See M 0630.
0154 Radio Netherlands: Documentary. Childless by Choice (22st). See F 1454.
0154 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (8th). See W 1254.
0154 Radio Netherlands: Documentary. Spanish Catholicism in Flux (29th). See F 2354.
0154 Radio Netherlands: Documentary. The Titantic: Encore (15th). Your second chance to hear Marijke van der Meer's acclaimed historical portrait of the doomed liner.

Radio Programs

(Contined from page 43)

0940 FEBC (Philippines): "DX Dial"
0940 KTWR (Guam): "Pacific DX Report"
1015 WWCR #3 (Tennessee): "Ask WWCR"
1030 VOA (as pac): "Communications World"
1100 Radio For Peace Intl: "World of Radio"
1215 Radio Bulgaria: "Radio Bulgaria Calling"
1230 VOA (as pac): "Communications World"
1230 WWCR #3: "World of Radio"
1342 Radio Tashkent: "Radio Tashkent DX Program"
1345 Voice of Turkey: "DX Corner (biweekly)"
1349 Radio Romania Intl: "DX Mailbag"
1400 WHRI (Angel 2): "DXing with Cumbre"
1455 FEBC (Philippines): "DX Dial"
1519 Radio Romania Intl: "DX Mailbag"
1600 WWCR #3 : "World of Radio"
1730 VOA (af): "Communications World"
1730 VOA (me): "Communications World"
1730 VOA (south as): "Communications World"
1800 Radio For Peace Intl: "World of Radio"
1830 WHRI (Angel 1): "DXing with Cumbre"
1909 HCJB (eu): "DX Partyline"
1949 Radio Romania Intl: "DX Mailbag"
2015 Voice of Turkey: "DX Corner (biweekly)"
2058 Vatican Radio: "On-the-Air"
2100 WWCR #3 (Tennessee): "Ask WWCR"
2130 VOA (me): "Communications World"
2134 Radio Havana Cuba: "DXers Unlimited"
2145 Radio Dnestr: "DX Herald (3)"
2149 Radio Romania Intl: "DX Mailbag"
2231 Spain, REE: "Distance Unknown"
2234 Radio Havana Cuba: "DXers Unlimited"
2300 Vatican Radio: "On-the-Air"
2300 KSDA (Guam): "Wavescan"
2315 Voice of Turkey: "DX Corner (biweekly)"
2330 WHRI (Angel 1): "DXing with Cumbre"

0200 UTC SHORTWAVE GUIDE 9:00 PM EST 6:00 PM PST

Frequencies

0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	9660pa	11640as	11695as	12080pa
		13605pa	13755pa	15240pa	15365pa
		15415as	17715as	17750pa	17795pa
		17880pa			
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0300	Canada, CBC N Quebec Svc	9625do			
0200-0300	Canada, CFCX Montreal	6005do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0300	Canada, R Canada Intl	5765am	6010am	9535am	9755am
		11725am			
0200-0300	Costa Rica,RF Peace Intl	6205am	7385am		
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB	9745am	21455am		
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	7265as	7285as	7355as
		9515as	9615as		
0200-0230	Hungary, Radio Budapest	5905na	9840na		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0200-0300	Lebanon, Voice of Hope	9960va			
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0230 s/vl	Malta, VO Mediterranean	15550as	17570au		
0200-0300	Netherlands, Radio	9860as	11655as		
0200-0225	Netherlands, Radio	5905as	7305as		
0200-0300	New Zealand, R NZ Intl	15115pa			
0200-0230 m	Norway, Radio Norway Intl	7125as	7440na	7465na	
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0300	Philippines, FEBC/R Intl	15450as			
0200-0300	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0200-0300	Russia,Voice of Russia WS	5930na	7105na	7345na	9550na
		9580na	12030na	13665na	
0200-0300 mtwhfa	Russia,Voice of Russia WS	5920na			
0200-0300	Slovakia, Adv World Radio	11610as			
0200-0300	South Korea, R Korea Intl	7275as	11725am	11810am	15575am
0200-0300	Sri Lanka, Sri Lanka BC	9730as			
0200-0300	Taiwan, VO Free China	5950na	7130as	9680na	11740ca
		11825as	15345as		
0200-0300	United Kingdom, BBC WS	5970sa	5975am	6135af	6175am
		9410na	9515am	9590am	9605as
		9915as	11955as	15280as	15360as
0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KVOH Los Angeles CA	9975am			
0200-0300	USA, KWHR Naalehu HI	17510au			
0200-0300	USA, Monitor Radio Intl	5850na	7535am		
0200-0300	USA, Voice of America	7115as	7205as	9740as	11705as
		15250as	15370as	17740as	21550as
0200-0300	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0200-0300	USA, WGTG McCaysville GA	5085am			
0200-0300	USA, WHRI Noblesville IN	5745am	7315am		
0200-0300	USA, WJCR Upton KY	7490na			
0200-0300 mtwhf	USA, WRMI/R Miami Intl	9955am			
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0300 mtwhf	USA, WVHA Greenbush ME	5850eu			
0200-0300	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0200-0226	Vietnam, Voice of	5940na			
0200-0230	Yugoslavia, Radio	6195na	7130na		
0215-0225	Nepal, Radio	7165do			
0230-0300	Albania, R Tirana Intl	6140na	7160na		
0230-0259	Austria, R Austria Intl	7325na	9495sa	9870ca	
0230-0245	Pakistan, Radio	7290as	15120as	15485as	17705as
		17725as			
0230-0300 vl	Philippines, R Pilipinas	11855me	15120me	15270me	
0230-0300	Sweden, Radio	6200na			
0230-0300	United Kingdom, BBC WS	7325am			
0230-0256	Vietnam, Voice of	5940na			
0245-0300	India, All India Radio	3945do	6045do	7110do	11830do
		15135do			
0245-0300	USA, WYFR Okeechobee FL	9355eu			
0250-0300	Vatican State, Vatican R	6095na	7305na		
0250-0300	Zambia, ZNBC Radio 2	6165do			

Selected Programs

Sundays

0200 Ecuador, HCJB Quito (am): Sounds of Joy. Bob Carlson with old recordings of sacred music.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. Opening three minutes of each transmission.
0203 Taiwan, V of Free China: News. Twelve minutes of world news.
0215 Taiwan, V of Free China: People. An introduction to people from all walks of life in Taiwan.
0230 Ecuador, HCJB Quito (am): Solstice. A musical program from New Zealand for young people.
0231 Taiwan, V of Free China: Mailbag Time. Host Carlton Wong reads letters from listeners and plays music requests.
0247 Taiwan, V of Free China: Let's Learn Chinese. Chinese lessons with commentary and translation in English.

Mondays

0200 Ecuador, HCJB Quito (am): Radio Reading Room. Readings from new Christian books.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. Chinese folk and temple music.
0230 Ecuador, HCJB Quito (am): L'Abri Lectures. Dr. Francis Schaeffer is the speaker.
0247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Tuesdays

0200 Ecuador, HCJB Quito (am): Let My People Think. See S 1530.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Taiwan Today. Focus on an aspect of Taiwanese life such as education.
0230 Ecuador, HCJB Quito (am): Classical Favorites. Dawn Lowther and Bill Rapley play popular classical music.
0230 Taiwan, V of Free China: Journey into Chinese Culture. Conversation about a particular cultural activity in Taiwan.
0245 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Wednesdays

0200 Ecuador, HCJB Quito (am): Simply Worship. See S 1300.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Music Box. Some of the popular music of Taiwan.
0230 Ecuador, HCJB Quito (am): Unshackled. See S 0630.
0249 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Thursdays

0200 Ecuador, HCJB Quito (am): The Book and the Spade. See M 0545.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Ecuador, HCJB Quito (am): The Book Nook. A book-reading program hosted by Marita Regier.
0215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
0230 Ecuador, HCJB Quito (am): Sounds of Joy. See S 0200.
0248 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.
0254 Radio Netherlands: Documentary. Childless by Choice (20th). See F 1454.
0254 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (6th). See W 1254.
0254 Radio Netherlands: Documentary. Spanish Catholicism in Flux (27th). See F 2354.
0254 Radio Netherlands: Documentary. The Titantic: Encore (13th). See A 2354.

Fridays

0200 Ecuador, HCJB Quito (am): Pacific Currents. Brent Allred presents HCJB's Asia/Pacific magazine.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Perspective. Carlton Wong describes the issues facing the lives and conversations of Taiwanese people.
0230 Ecuador, HCJB Quito (am): Inspirational Classics. A half-hour of recorded classical music with an ecclesiastical flavor.
0233 Taiwan, V of Free China: New Record Time. The latest releases of the popular music of Taiwan.
0247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.
0248 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Saturdays

0200 Ecuador, HCJB Quito (am): On-Line. A magazine program of music, politics, arts, and science in Europe.
0200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
0203 Taiwan, V of Free China: News. See S 0203.
0215 Taiwan, V of Free China: Kaleidoscope. See S 0315.
0230 Ecuador, HCJB Quito (am): On Track. Good comtemporary music and helpful thoughts. (www.ontrack.org)
0232 Taiwan, V of Free China: Reflections. See S 0332.
0248 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Frequencies

0300-0400	Australia, Radio	9660pa	11640as	12080pa	13605pa
		13755pa	15240pa	15365pa	15415as
		15510as	17715as	17750pa	17795pa
		17880pa			
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFCX Montreal	6005do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0400	Canada, R Canada Intl	6010am	9755am		
0300-0400	China, China Radio Intl	9690am	9710am	11695am	
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Costa Rica,RF Peace Intl	6205am	7385am		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB	9745am	21455am		
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6085na	9535na	9650na
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400	Japan, R Japan/NHK World	5960na	11790na	11840as	15230na
		17810as			
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0300-0400	Lebanon, Voice of Hope	9960va			
0300-0400 s/vl	Malta, VO Mediterranean	15550as	17570au		
0300-0325	Netherlands, Radio	9860as	11655as		
0300-0400	New Zealand, R NZ Intl	15115pa			
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia,Voice of Russia WS	5930na	5940na	6150na	7105na
		7175na	7345na	9580na	
0300-0400 mtwhfa	Russia,Voice of Russia WS	5920na			
0300-0355	S Africa, Channel Africa	3220af	5955af		
0300-0400	Sri Lanka, Sri Lanka BC	9730as			
0300-0400	Taiwan, VO Free China	5950na	9680na	11745as	11825as
		15345as			
0300-0330	Thailand, Radio	9655na	11890na	11905na	
0300-0315 mtwhf	Uganda, Radio	3340do			
0300-0400	Ukraine, R Ukraine Intl	5915na	7150na	7180na	
0300-0330	United Kingdom, BBC WS	6135af	7235am	15360as	
0300-0400	United Kingdom, BBC WS	3255af	3955eu	5975am	6005af
		6175am	6190af	6195eu	9410va
		9515am	9590am	9600af	9605as
		11730af	11760va	12095af	15310as
0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	USA, KWHR Naalehu HI	17510au			
0300-0400	USA, Monitor Radio Intl	5850na	7535af		
0300-0400	USA, Voice of America	6035af	6080af	7105af	7290af
		7340af	7415af	9575af	9885af
0300-0330 smtwh	USA, Voice of America	4960af			
0300-0400	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0300-0400	USA, WGTG McCaysville GA	5085am			
0300-0400	USA, WHRI Noblesville IN	5760am			
0300-0400	USA, WJCR Upton KY	7490na			
0300-0400	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0345	USA, WYFR Okeechobee FL	9355eu			
0300-0310	Vatican State, Vatican R	6095na	7305na		
0300-0400 mtwhfa	Zambia, ZNBC Radio 2	6165do			
0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0310-0340	Vatican State, Vatican R	7360af			
0315-0330 s	Greece, Voice of	6125na	7450na	9420na	
0330-0357	Czech Rep, Radio Prague	7350as			
0330-0400	Hungary, Radio Budapest	6195na	9840na		
0330-0400 vl	Philippines, R Pilipinas	13770as	15330na	17730as	
0330-0400	Slovakia, Adv World Radio	9465af			
0330-0400	Sweden, Radio	7115na			
0330-0353	UAE, Radio Dubai	13675na	15395eu	21605na	
0330-0400	United Kingdom, BBC WS	9610af	11955as	15280as	
0335-0355 vl	India, All India Radio	7110do	11830do	15135do	
0340-0350	Greece, Voice of	6125na	7450na	9420na	
0345-0400 irreg	Burundi, Radio Nationale	6140do			
0345-0400 as	Uganda, Radio	3340do			
0356-0400	Zambia, Christian Voice	3330af			

Selected Programs

Sundays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): Songtime Weekend. Evangelical teachings and music from Boston.
0303 Taiwan, V of Free China: News. See S 0203.
0305 Czech Rep, Radio Prague: Live in Prague. See S 0005.
0315 Taiwan, V of Free China: Kaleidoscope. Spotlight on life in Taiwan.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): Sports Spectrum. News from the world of sports.
0332 Taiwan, V of Free China: Reflections. The best of Chinese literature.
0335 Czech Rep, Radio Prague: Live in Prague. See S 0005.

Mondays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): The Sower. Michael Guido presents music and inspiration.
0303 Taiwan, V of Free China: News. See S 0203.
0304 Czech Rep, Radio Prague: The Week in Politics. See S 1134.
0313 Czech Rep, Radio Prague: From the Weeklies. See S 1143.
0315 Ecuador, HCJB Quito (am): The Word Today. A discussion of Biblical themes.
0315 Taiwan, V of Free China: People. See S 0215.
0319 Czech Rep, Radio Prague: Media Check. See S 1149.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): Joy International. Dave Freeland hosts a program of Christian music.
0334 Czech Rep, Radio Prague: The Week in Politics. See S 1134.
0336 Taiwan, V of Free China: Mailbag Time. See S 0231.
0343 Czech Rep, Radio Prague: From the Weeklies. See S 1143.
0349 Czech Rep, Radio Prague: Media Check. See S 1149.

Tuesdays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): Chords of Love. Music to encourage you.
0303 Taiwan, V of Free China: News. See S 0203.
0311 Czech Rep, Radio Prague: Magazine '96. See M 1141.
0315 Ecuador, HCJB Quito (am): Rendezvous. Dick Saunders presents Bible study and evangelism.
0315 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): MasterControl. A magazine program of current topics, lifestyle issues, and Christian themes. (www.mastercontrol.org)
0341 Czech Rep, Radio Prague: Magazine '96. See M 1141.

Wednesdays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): Psychology for Living. Clyde Narramore of California gives Christian advice on issues of today.
0303 Taiwan, V of Free China: News. See S 0203.
0311 Czech Rep, Radio Prague: Talking Point. See T 1141.
0315 Ecuador, HCJB Quito (am): Rendezvous. See T 0315.
0315 Taiwan, V of Free China: Taiwan Today. See T 0215.
0323 Czech Rep, Radio Prague: Media Check. See S 1149.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): Stories of Great Christians. Radio drama with Christian theme from the Moody Bible Institute. (www.moody.edu)
0330 Taiwan, V of Free China: Journey into Chinese Culture. See T 0230.
0341 Czech Rep, Radio Prague: Talking Point. See T 1141.
0345 Ecuador, HCJB Quito (am): Wonderful Words of Life. Messages from the Salvation Army.
0353 Czech Rep, Radio Prague: Media Check. See S 1149.

Thursdays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): CBF Presents. Christian activities in the Caribbean.
0303 Taiwan, V of Free China: News. See S 0203.
0311 Czech Rep, Radio Prague: From the Archives. See W 1141.
0315 Ecuador, HCJB Quito (am): Rendezvous. See T 0315.
0315 Taiwan, V of Free China: Music Box. See W 0215.
0318 Czech Rep, Radio Prague: The Arts. See W 1148.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): The Living Word. See T 1300.
0341 Czech Rep, Radio Prague: From the Archives. See W 1141.
0348 Czech Rep, Radio Prague: The Arts. See W 1148.

Fridays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): Words for Women. Helpful ideas for family living.
0303 Taiwan, V of Free China: News. See S 0203.
0314 Czech Rep, Radio Prague: Economic Report. See H 1144.
0315 Ecuador, HCJB Quito (am): Rendezvous. See T 0315.
0315 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
0320 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1150.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): Christian Brotherhood Hour. See H 1300.
0344 Czech Rep, Radio Prague: Economic Report. See H 1144.
0350 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1150.

Saturdays

0300 Czech Rep, Radio Prague: News. See S 0000.
0300 Ecuador, HCJB Quito (am): Science, Scripture and Salvation. Proving scientific principles with the Bible.
0303 Taiwan, V of Free China: News. See S 0203.
0312 Czech Rep, Radio Prague: Between You and Us. See F 1112.
0315 Ecuador, HCJB Quito (am): Rendezvous. See T 0315.
0315 Taiwan, V of Free China: Perspective. See F 0215.
0330 Czech Rep, Radio Prague: News. See S 0000.
0330 Ecuador, HCJB Quito (am): Adventures in Odyssey. See S 0000.
0332 Taiwan, V of Free China: New Record Time. See F 0233.
0342 Czech Rep, Radio Prague: Between You and Us. See F 1112.

Frequencies

0400-0500	Australia, Radio	9660pa	11880pa	12080pa	13605as
		15240pa	15365pa	15415as	15510as
		17750as	17795pa	17880pa	
0400-0500 as	Australia, Radio	11640as			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500 vl	Canada, CBC N Quebec Svc	9625do			
0400-0500	Canada, CFCX Montreal	6005do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0430	Canada, R Canada Intl	6150me	9505me	9645me	
0400-0500	China, China Radio Intl	9560am	9730am		
0400-0500	Costa Rica,RF Peace Intl	6205am	7385am		
0400-0500	Cuba, Radio Havana	6000na	6180na	9820na	9830na
0400-0500	Ecuador, HCJB	9745am	21455am		
0400-0450	Germany, Deutsche Welle	6015af	6065af	7225af	7265af
		9565af			
0400-0500 twhfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0400-0500	Lebanon, Voice of Hope	9960va			
0400-0430 s/vl	Malta, VO Mediterranean	15550as	17570au		
0400-0430	Mexico, Radio Mexico Intl	9705na			
0400-0458	New Zealand, R NZ Intl	15115pa			
0400-0450	North Korea, R Pyongyang	15180as	15230as	17765as	
0400-0430 m	Norway, Radio Norway Intl	5965eu	7305me	7520na	
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0430	Romania, R Romania Intl	5990na	6155na	9510na	9570na
		11940na			
0400-0500	Russia,Voice of Russia WS	5930na	6150na	7175na	7345na
		9580na			
0400-0500 mtwhfa	Russia,Voice of Russia WS	5920na			
0400-0455	S Africa, Channel Africa	5955af	9585af		
0400-0430	Slovakia, Adv World Radio	11600af			
0400-0430	Sri Lanka, Sri Lanka BC	9730as			
0400-0430	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0430	Tanzania, Radio	5050af			
0400-0500	Turkey, Voice of	7300na	9685eu	17705eu	
0400-0415	Uganda, Radio	5026do			
0400-0500	Ukraine, R Ukraine Intl	5915na	7150na	9550na	
0400-0500	United Kingdom, BBC WS	3255af	3955eu	5975af	6005af
		6175am	6180eu	6190af	6195eu
		7160af	9410af	9590am	9600af
		9610af	11760va	11955as	12085af
		15280as	15310as	15575va	
0400-0430	United Kingdom, BBC WS	9605as	11730af		
0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	USA, KWHR Naalehu HI	17780as			
0400-0500	USA, Monitor Radio Intl	7535eu	9840af		
0400-0500	USA, Voice of America	6035af	6080af	7145af	7340af
		7415af	9575af	9775af	
0400-0500	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0400-0500	USA, WGTG McCaysville GA	5085am			
0400-0500	USA, WHRI Noblesville IN	5760am			
0400-0500	USA, WJCR Upton KY	7490na			
0400-0500 smtwhf	USA, WMLK Bethel PA	9465eu			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0500	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0400-0500	USA, WYFR Okeechobee FL	9985af			
0400-0445	USA, WYFR Okeechobee FL	6065na	9505na		
0400-0430	Vietnam, Voice of	12020na	15010na		
0400-0500	Zambia, Christian Voice	3330af			
0400-0410	Zambia, ZNBC Radio 2	6165do			
0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0415-0500 m	USA, WRMI/R Miami Intl	9955am			
0425-0500	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0430-0500	Australia,DefenseForces R	13525as			
0430-0455 mtwhf	Moldova, R Moldova Intl	7520eu			
0430-0500	Netherlands, Radio	5995na	6165na		
0430-0500 twhfa	Portugal, R Portugal Intl	6150am	9570am		
0430-0500	Swaziland, Trans World R	3200af	4775af	6070af	6100af
0430-0500	Switzerland, Swiss R Intl	9905na			
0430-0500	United Kingdom, BBC WS	15420af			
0430-0500	USA, Voice of America	7170va			
0459-0500	New Zealand, R NZ Intl	11905pa			

Selected Programs

Sundays

0400 Cuba, Radio Havana Cuba: International News. News from around the world.
0400 Ecuador, HCJB Quito (am): Latin and International News. Ten minutes of regional and world news.
0409 Ecuador, HCJB Quito (am): DX Partyline. See S 0109.
0411 Cuba, Radio Havana Cuba: National News. News about Cuba.
0416 Cuba, Radio Havana Cuba: Feature Report. In-depth coverage of a news item from another country of the hemisphere.
0421 Cuba, Radio Havana Cuba: Music. The ever-popular latin music of Cuba.
0429 Cuba, Radio Havana Cuba: News Supplement. A five-minute news summary on the half-hour.
0434 Cuba, Radio Havana Cuba: DXers Unlimited. Arnie Coro discusses the technical aspects of shortwave listening and amateur radio.
0448 Cuba, Radio Havana Cuba: Music. See S 0421.

Mondays

0400 Cuba, Radio Havana Cuba: Sunday Edition (from 0300). The second hour of RHC's two-hour magazine of features, reports, and music.
0400 Ecuador, HCJB Quito (am): Latin and International News. See S 0400.
0401 Cuba, Radio Havana Cuba: The Mailbag Show. Listener letters and E-mail are reviewed and answered.
0410 Ecuador, HCJB Quito (am): Saludos Amigos. See M 0109.
0430 Cuba, Radio Havana Cuba: Breakthrough. Arnie Coro's weekly science and technology update.
0435 Cuba, Radio Havana Cuba: From Havana. A showcase of Cuban music.

Tuesdays

0400 Cuba, Radio Havana Cuba: International News. See S 0400.
0400 Ecuador, HCJB Quito (am): News. See S 0100.
0410 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0413 Cuba, Radio Havana Cuba: National News. See S 0411.
0418 Cuba, Radio Havana Cuba: Spotlight on the Americas. Issues and events in the hemisphere.
0421 Cuba, Radio Havana Cuba: Be My Guest. Interviewing a visitor to Cuba.
0426 Cuba, Radio Havana Cuba: Music. See S 0421.
0430 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0430 Ecuador, HCJB Quito (am): You Should Know. See T 0130.
0435 Cuba, Radio Havana Cuba: Timeout. Five minutes of Cuban sports coverage.
0450 Cuba, Radio Havana Cuba: Music. See S 0421.

Wednesdays

0400 Cuba, Radio Havana Cuba: International News. See S 0400.
0400 Ecuador, HCJB Quito (am): News. See S 0100.
0408 Cuba, Radio Havana Cuba: National News. See S 0411.
0410 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0413 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0417 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0427 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0430 Ecuador, HCJB Quito (am): El Mundo Futuro. See W 0130.
0432 Cuba, Radio Havana Cuba: Timeout. See T 0435.
0438 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

Thursdays

0400 Cuba, Radio Havana Cuba: International News. See S 0400.
0400 Ecuador, HCJB Quito (am): News. See S 0100.
0410 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0413 Cuba, Radio Havana Cuba: National News. See S 0411.
0419 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0424 Cuba, Radio Havana Cuba: Music. See S 0421.
0430 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0430 Ecuador, HCJB Quito (am): Ham Radio Today. See H 0130.
0438 Cuba, Radio Havana Cuba: Timeout. See T 0435.
0454 Radio Netherlands: Documentary. Childless by Choice (20th). See F 1454.
0454 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (6th). See W 1254.
0454 Radio Netherlands: Documentary. Spanish Catholicism in Flux (27th). See F 2354.
0454 Radio Netherlands: Documentary. The Titantic: Encore (13th). See A 2354.

Fridays

0400 Cuba, Radio Havana Cuba: International News. See S 0400.
0400 Ecuador, HCJB Quito (am): News. See S 0100.
0408 Cuba, Radio Havana Cuba: National News. See S 0411.
0410 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0413 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0417 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0429 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0430 Ecuador, HCJB Quito (am): Woman to Woman. See F 0130.
0434 Cuba, Radio Havana Cuba: Timeout. See T 0435.
0439 Cuba, Radio Havana Cuba: Cuba Today. See W 0550.

Saturdays

0400 Cuba, Radio Havana Cuba: International News. See S 0400.
0400 Ecuador, HCJB Quito (am): News. See S 0100.
0409 Ecuador, HCJB Quito (am): Studio 9. See T 0110.
0411 Cuba, Radio Havana Cuba: National News. See S 0411.
0416 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0425 Cuba, Radio Havana Cuba: Music. See S 0421.
0430 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0430 Ecuador, HCJB Quito (am): Musica del Ecuador. See M 0630.
0436 Cuba, Radio Havana Cuba: Timeout. See T 0435.

Frequencies

0500-0600	Australia, Radio	9660pa	11880pa	12080pa	13605as
		15240pa	15365pa	17715pa	17795pa
		17880pa			
0500-0600 as	Australia, Radio	11640as			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Australia,DefenseForces R	13525as			
0500-0600	Bulgaria, Radio	7375na	9485na		
0500-0600	Canada, CFCX Montreal	6005do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	9560am			
0500-0600	Costa Rica, Adv World R	5030ca	6150ca	9725ca	
0500-0600	Costa Rica,RF Peace Intl	6205am	7385am		
0500-0600	Cuba, Radio Havana	9820na	9830na		
0500-0600	Ecuador, HCJB	9745am	21455am		
0500-0550	Germany, Deutsche Welle	6120na	6145na	6185na	9650na
0500-0515	Israel, Kol Israel	7465na	9435na	17545af	
0500-0600	Japan, R Japan/NHK World	6110na	6150eu	9835na	11740as
		11910am	11920na	17810as	
0500-0530	Japan, R Japan/NHK World	9635am	11895am	12000am	
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0500-0600	Lebanon, Voice of Hope	9960va			
0500-0510 mtwhf	Malawi, MBC	3380do			
0500-0530 m-a/vl	Mexico, Radio Mexico Intl	9705na			
0500-0525	Netherlands, Radio	5995na	6165na		
0500-0600	New Zealand, R NZ Intl	11905pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia,Voice of Russia WS	5930na	6150na	7175na	
0500-0600 mtwhfa	Russia,Voice of Russia WS	5920na			
0500-0555	S Africa, Channel Africa	5955af	11900af		
0500-0600	Slovakia, Adv World Radio	7215eu			
0500-0600	Spain, R Exterior Espana	6055am			
0500-0600	Swaziland, Trans World R	3200af	4775af	6070af	6100af
		9500af			
0500-0515	Uganda, Radio	3340do			
0500-0600	United Kingdom, BBC WS	3255af	3955va	5975am	6005af
		6175am	6180va	6190af	6195eu
		7150va	7160af	9410va	9600af
		9740as	11760va	11955as	12095va
		15310as	15360as	15420af	15575va
	17640af	17885af			
0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	USA, KWHR Naalehu HI	9930as			
0500-0600	USA, Monitor Radio Intl	7535eu			
0500-0600	USA, Voice of America	5970af	6035af	6080af	7170va
		7295af	9700va	9775af	11825me
		12080af	12085eu	15205me	
0500-0600	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0500-0600	USA, WGTG McCaysville GA	5085am			
0500-0600	USA, WHRI Noblesville IN	5760am	7315am		
0500-0600	USA, WJCR Upton KY	7490na			
0500-0600 mtwhfa	USA, WMLK Bethel PA	9465eu			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0600	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0500-0600	USA, WYFR Okeechobee FL	5985na	9985eu	11695af	
0500-0528	Vatican State, Vatican R	5882eu	9660af	11625af	
0500-0600	Zambia, Christian Voice	3330af			
0500-0510	Zambia, ZNBC Radio 1	7220do			
0500-0510	Zambia, ZNBC Radio 2	6165do			
0500-0530 vl	Zimbabwe, Zimbabwe BC	3396do			
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0559	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Romania, R Romania Intl	11940af	15250af	15365af	17745af
		17790af			
0530-0600	Russia,Voice of Russia WS	5905na	7330na		
0530-0600	Slovakia, Adv World Radio	11600eu			
0530-0600	Thailand, Radio	9655eu	11905eu	15115eu	
0530-0600 vl	Zimbabwe, Zimbabwe BC	5975do			
0555-0600	Malaysia, Voice of	6175as	9750as	15295au	

Selected Programs

Sundays

0500 Cuba, Radio Havana Cuba: International News. See S 0400.
0500 Ecuador, HCJB Quito (am): Musical Mailbag. See S 0030.
0509 Ecuador, HCJB Quito (am): Sounds of Joy. See S 0200.
0513 Cuba, Radio Havana Cuba: National News. See S 0411.
0518 Cuba, Radio Havana Cuba: Viewpoint. An editorial comment on a current event or topic.
0522 Cuba, Radio Havana Cuba: Music. See S 0421.
0530 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0536 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

Mondays

0500 Cuba, Radio Havana Cuba: Sunday Edition. RHC's two-hour magazine of features, reports, and music.
0500 Ecuador, HCJB Quito (am): Radio Reading Room. See M 0200.
0530 Cuba, Radio Havana Cuba: Musical Corner. Top ten countdown of Cuba's popular music.
0530 Ecuador, HCJB Quito (am): The Sower. See M 0300.
0545 Ecuador, HCJB Quito (am): The Book and the Spade. The quest for biblical knowledge through archaeology.

Tuesdays

0500 Cuba, Radio Havana Cuba: International News. See S 0400.
0500 Ecuador, HCJB Quito (am): Let My People Think. See S 1530.
0510 Cuba, Radio Havana Cuba: National News. See S 0411.
0516 Cuba, Radio Havana Cuba: Viewpoint. See S 0518.
0520 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0530 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0530 Ecuador, HCJB Quito (am): Classical Favorites. See T 0230.
0535 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

Wednesdays

0500 Cuba, Radio Havana Cuba: International News. See S 0400.
0500 Ecuador, HCJB Quito (am): Simply Worship. See S 1300.
0510 Cuba, Radio Havana Cuba: National News. See S 0411.
0516 Cuba, Radio Havana Cuba: Viewpoint. See S 0518.
0520 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0530 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0530 Ecuador, HCJB Quito (am): Unshackled. See S 0630.
0535 Cuba, Radio Havana Cuba: DXers Unlimited. See S 0434.
0550 Cuba, Radio Havana Cuba: Cuba Today. A slice of life in Havana.

Thursdays

0500 Cuba, Radio Havana Cuba: International News. See S 0400.
0500 Ecuador, HCJB Quito (am): The Book and the Spade. See M 0545.
0512 Cuba, Radio Havana Cuba: National News. See S 0411.
0515 Ecuador, HCJB Quito (am): The Book Nook. See H 0215.
0518 Cuba, Radio Havana Cuba: Viewpoint. See S 0518.
0520 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0530 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0530 Ecuador, HCJB Quito (am): Sounds of Joy. See S 0200.
0536 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

Fridays

0500 Cuba, Radio Havana Cuba: International News. See S 0400.
0500 Ecuador, HCJB Quito (am): Pacific Currents. See F 0200.
0510 Cuba, Radio Havana Cuba: National News. See S 0411.
0515 Cuba, Radio Havana Cuba: Viewpoint. See S 0518.
0519 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0530 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0530 Ecuador, HCJB Quito (am): Inspirational Classics. See F 0230.
0535 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

Saturdays

0500 Cuba, Radio Havana Cuba: International News. See S 0400.
0500 Ecuador, HCJB Quito (am): On-Line. See A 0200.
0512 Cuba, Radio Havana Cuba: National News. See S 0411.
0518 Cuba, Radio Havana Cuba: Viewpoint. See S 0518.
0520 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0530 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0530 Ecuador, HCJB Quito (am): On Track. See A 0230.
0536 Cuba, Radio Havana Cuba: Weekly Review. The end of the week wrap-up of international and national events affecting Cuba.
0550 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

MT Monitoring Team

Next Reporting Deadline: February 17, 1997

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THANK YOU ...

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Frequencies

0600-0700	Australia, Radio	9660pa	9860pa	11880pa	12080pa
		13605as	15240pa	15365pa	15415as
		15530as	17715as	17880pa	
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0633	Australia,DefenseForces R	13525as			
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFCX Montreal	6005do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0630 mtwhf	Canada, R Canada Intl	6050eu	6150eu	9740af	9760af
		11905me			
0600-0700	Costa Rica,RF Peace Intl	6205am	7385am		
0600-0700	Cuba, Radio Havana	9820na	9830na		
0600-0700	Ecuador, HCJB	9745am	21455am		
0600-0650	Germany, Deutsche Welle	7225af	9565af	11765af	13790af
		17820as	21705me		
0600-0615	Ghana, Ghana Broadc Corp	3366do	4915do		
0600-0700 vl	Italy, IRRS	3985va			
0600-0700	Japan, R Japan/NHK World	11850as	11910as	17810au	
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0600-0700 vl	Kiribati, Radio	9825do			
0600-0700	Lebanon, Voice of Hope	9960va			
0600-0700	Malaysia, Voice of	6175as	9750as	15295au	
0600-0700	New Zealand, R NZ Intl	11905pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0600-0700	North Korea, R Pyongyang	15180as	15230as		
0600-0630 s	Norway, Radio Norway Intl	5965eu	7180af	9590me	15235af
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Russia,Voice of Russia WS	5905na	5920na	5930na	6150na
		7175na	7330na	12025pa	12035as
		15460as	15470au	17570pa	21790au
0600-0700	S Africa, Trans World R	11730af			
0600-0610	Sierra Leone, SLBS	3316do			
0600-0630	Slovakia, Adv World Radio	13715af			
0600-0700	Slovakia, Adv World Radio	5905am			
0600-0630 vl	Solomon Islands, SIBC	5020do	9545do		
0600-0700	Swaziland, Trans World R	3200af	4775af	6070af	6100af
		9500af	9650af		
0600-0630	Switzerland, Swiss R Intl	9885af	11860af	13635af	
0600-0700	United Kingdom, BBC WS	3955eu	5975am	6005af	6175eu
		6180va	6190af	6195eu	7145as
		7160af	7325va	9410eu	9600af
		9740as	11940af	11955as	15310as
		15360as	15420af	17640af	17790as
	17885af	21660as			
0600-0700	USA, KAIJ Dallas TX	5810am			
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	9930as			
0600-0700	USA, Monitor Radio Intl	7535eu			
0600-0700	USA, Voice of America	5970eu	5995va	6035eu	6080eu
		7170va	7285af	9760me	11805va
		11825me	11950eu	15205me	15600eu
0600-0700	USA, WGTG McCaysville GA	5085am			
0600-0700	USA, WHRI Noblesville IN	5760am	7315am		
0600-0700	USA, WJCR Upton KY	7490na			
0600-0700 smtwhf	USA, WMLK Bethel PA	9465eu			
0600-0700	USA, WRNO New Orleans LA	7355am			
0600-0700	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0600-0700	USA, WYFR Okeechobee FL	5985af	7355eu	9985af	
0600-0620	Vatican State, Vatican R	5880eu	7250eu		
0600-0645 vl/m-f	Vatican State, vatican R	15215me			
0600-0630	Vietnam, Voice of	5925as	10060as		
0600-0700	Yemen, Yemeni Rep Radio	9780do			
0600-0700	Zambia, Christian Voice	3330af			
0600-0605 mtwhfa	Zambia, ZNBC Radio 1	7220do			
0600-0630	Zambia, ZNBC Radio 2	6165do			
0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0615-0630	Switzerland, Swiss R Intl	5840eu	6165eu		
0630-0655	Austria, R Austria Intl	6015na			
0630-0657	Georgia, Radio	11910eu			
0630-0700	United Kingdom, BBC WS	11780va	15565va		
0630-0700	Vatican State, Vatican R	11625af	13765af	15570af	
0631-0640	Romania, R Romania Intl	7105eu	9625eu	9665eu	11775eu
0645-0700	Romania, R Romania Intl	15370pa	17720pa	17790as	17805as

Selected Programs

Sundays

0600 Cuba, Radio Havana Cuba: International News. See S 0400.
0600 Ecuador, HCJB Quito (am): Afterglow. Don Johnson plays religious music.
0611 Cuba, Radio Havana Cuba: National News. See S 0411.
0616 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0621 Cuba, Radio Havana Cuba: Music. See S 0421.
0629 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0630 Ecuador, HCJB Quito (am): Unshackled. Pacific Garden Mission's radio drama.
0634 Cuba, Radio Havana Cuba: DXers Unlimited. See S 0434.
0648 Cuba, Radio Havana Cuba: Music. See S 0421.

Mondays

0600 Cuba, Radio Havana Cuba: Sunday Edition (from 0500). See M 0400.
0600 Ecuador, HCJB Quito (am): Mountain Meditations. See S 1330.
0601 Cuba, Radio Havana Cuba: The Mailbag Show. See M 0401.
0630 Cuba, Radio Havana Cuba: Breakthrough. See M 0430.
0630 Ecuador, HCJB Quito (am): Musica del Ecuador. Jorge Zambrano presents a unique mix of Ecuadorian music (highly rated).
0635 Cuba, Radio Havana Cuba: From Havana. See M 0435.

Tuesdays

0600 Cuba, Radio Havana Cuba: International News. See S 0400.
0600 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
0613 Cuba, Radio Havana Cuba: National News. See S 0411.
0615 Ecuador, HCJB Quito (am): Key Life. See M 1415.
0618 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0621 Cuba, Radio Havana Cuba: Be My Guest. See T 0421.
0626 Cuba, Radio Havana Cuba: Music. See S 0421.
0630 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0630 Ecuador, HCJB Quito (am): Nightsounds. Christian music and thoughtful words from Bill Pearce.
0635 Cuba, Radio Havana Cuba: Timeout. See T 0435.
0650 Cuba, Radio Havana Cuba: Music. See S 0421.

Wednesdays

0600 Cuba, Radio Havana Cuba: International News. See S 0400.
0600 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
0608 Cuba, Radio Havana Cuba: National News. See S 0411.
0613 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0615 Ecuador, HCJB Quito (am): Key Life. See M 1415.
0617 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0627 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0630 Ecuador, HCJB Quito (am): Nightsounds. See T 0630.
0632 Cuba, Radio Havana Cuba: Timeout. See T 0435.
0638 Cuba, Radio Havana Cuba: Feature Report. See S 0416.

Thursdays

0600 Cuba, Radio Havana Cuba: International News. See S 0400.
0600 Ecuador, HCJB Quito (am): Gateway to Jo[illegible] See M 1400.
0613 Cuba, Radio Havana Cuba: National News. See S 0411.
0615 Ecuador, HCJB Quito (am): Key Life. See M 1415.
0619 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0624 Cuba, Radio Havana Cuba: Music. See S 0421.
0630 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0630 Ecuador, HCJB Quito (am): Nightsounds. See T 0630.
0638 Cuba, Radio Havana Cuba: Timeout. See T 0435.

Fridays

0600 Cuba, Radio Havana Cuba: International News. See S 0400.
0600 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
0608 Cuba, Radio Havana Cuba: National News. See S 0411.
0613 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0615 Ecuador, HCJB Quito (am): Key Life. See M 1415.
0617 Cuba, Radio Havana Cuba: Feature Report. See S 0416.
0629 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0630 Ecuador, HCJB Quito (am): Nightsounds. See T 0630.
0634 Cuba, Radio Havana Cuba: Timeout. See T 0435.
0639 Cuba, Radio Havana Cuba: Cuba Today. See W 0550.

Saturdays

0600 Cuba, Radio Havana Cuba: International News. See S 0400.
0600 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
0611 Cuba, Radio Havana Cuba: National News. See S 0411.
0615 Ecuador, HCJB Quito (am): Key Life. See M 1415.
0616 Cuba, Radio Havana Cuba: Spotlight on the Americas. See T 0418.
0625 Cuba, Radio Havana Cuba: Music. See S 0421.
0630 Cuba, Radio Havana Cuba: News Supplement. See S 0429.
0630 Ecuador, HCJB Quito (am): Nightsounds. See T 0630.
0636 Cuba, Radio Havana Cuba: Timeout. See T 0435.

Hauser's Highlights
CANADA: CBC Northern

The following are mostly musical CBC Radio shows, airing on weekends, after news on the hour, on 9625 kHz.

Sat	1800-1900	*Definitely Not the Opera*
Sun	0000	*Random Sampling*
	0100-0300	*Finkleman's 45s*
	0300	*A propos*
	0400-0600	*Saturday Night Blues*
Mon	0100-0300	*On Stage at the Gould*
	0300	*Sunday Showcase*
	0400-0600	*Jazz Beat*

(via Dave Jeffery)

FREQUENCIES

0700-0800	Australia, Radio	6020pa	9580pa	9660pa	9710as
		9860pa	12080pa	15240pa	15365pa
		15415as	15530as	17715pa	17880as
0700-0800 as	Australia, Radio	11640as			
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Canada, CFCX Montreal	6005do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica,RF Peace Intl	6205am	7385am		
0700-0800	Ecuador, HCJB	5860eu	9445pa	21455au	
0700-0800 as	Eqt Guinea, R East Africa	15186af			
0700-0800 mtwhf	Eqt Guinea, Radio Africa	15186af			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800 vl	Italy, IRRS	3985va			
0700-0800	Japan, R Japan/NHK World	7230eu	11740as	11850pa	11910as
		11920as	15165me	15590me	17810va
		17815af			
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0700-0800 vl	Kiribati, Radio	9825do			
0700-0800	Lebanon, Voice of Hope	9960va			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	9750as	15295au		
0700-0710	Malaysia, Voice of	6175as			
0700-0715 mtwhf	New Zealand, R NZ Intl	11905pa			
0700-0758 as	New Zealand, R NZ Intl	11905pa			
0700-0750	North Korea, R Pyongyang	15340af	17765me		
0700-0745	Romania, R Romania Intl	15370pa	17720pa	17790pa	17805pa
0700-0715 s	Romania, R Romania Intl	15370pa	17720pa	17790pa	17805pa
0700-0800	Russia,Voice of Russia WS	5905as	5930na	6150na	7175na
		7330na	12025au	12035as	15460as
		15470pa	17570pa	21790au	
0700-0800 mtwhfa	Russia,Voice of Russia WS	5920na			
0700-0710	Sierra Leone, SLBS	3316do			
0700-0800 vl	Solomon Islands, SIBC	5020do	9545do		
0700-0800	Swaziland, Trans World R	4775af	6100af	9500af	9650af
0700-0800	Taiwan, VO Free China	5950na			
0700-0800	United Kingdom, BBC WS	3955eu	5975am	6175eu	6180va
		6190af	6195eu	7145as	7325eu
		9410eu	9600af	9740as	11760as
		11780va	11940af	11955as	12095va
		15310as	15360as	15400af	15485va
	15565va	15575me	17640af	17790as	
	17830af	21660as			
0700-0800 as	United Kingdom, BBC WS	17885af			
0700-0715	United Kingdom, BBC WS	6005af	7160af		
0700-0800	USA, KAIJ Dallas TX	5810am			
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9975am			
0700-0800	USA, KWHR Naalehu HI	9930au			
0700-0800	USA, Monitor Radio Intl	7535eu			
0700-0800	USA, WEWN Birmingham AL	5825eu	6890na	7425na	
0700-0800	USA, WHRI Noblesville IN	5760am	7315am		
0700-0800	USA, WJCR Upton KY	7490na			
0700-0800 smtwhf	USA, WMLK Bethel PA	9465eu			
0700-0800	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0700-0745	USA, WYFR Okeechobee FL	7355eu	9985eu		
0700-0800	USA, WYFR Okeechobee FL	9455af			
0700-0800 vl	Vanuatu, Radio	3945do	7260do		
0700-0745 vl/m-f	Vatican State, Vatican R	4005eu	5880eu	7250eu	9645eu
0700-0800	Zambia, Christian Voice	6065af			
0700-0800	Zambia, ZNBC Radio 2	6165do			
0700-0800 vl	Zimbabwe, Zimbabwe BC	5975do			
0703-0710 mtwhf	Croatia, Croatian Radio	5895eu	5920eu	7165eu	9830eu
		11635eu	11830eu	13830eu	
0710-0800 vl	Papua New Guinea, NBC	4890do			
0715-0730	Switzerland, Swiss R Intl	5840eu	6165eu		
0720-0800 vl	Chile, R Esperanza	6089am			
0730-0800	Belgium, R Vlaanderen Int	5985eu	9925eu	9940au	
0730-0745 s	Greece, Voice of	7450eu	9425eu	15175au	
0730-0735	India, All India Radio	15185do	15260do		
0730-0800	Netherlands, Radio	9830au	11895pa		
0730-0800 as	Palau, KHBN/Voice of Hope	9730as			
0740-0800	Guam, TWR/KTWR	15200as			
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0745-0755	Greece, Voice of	7450eu	9425eu	15175au	
0745-0755 as	Monaco, Trans World Radio	7115eu			
0755-0800 mtwhf	Monaco, Trans World Radio	7115eu			
0759-0800 as	New Zealand, R NZ Intl	9700pa			

0800-0900	Australia, Radio	5995pa	6020pa	6080pa	9510as
		9580pa	9710pa	9860pa	12080pa
		13605pa	15530as	17715pa	21725as
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900	Canada, CFCX Montreal	6005do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0835 vl	Chile, R Esperanza	6089am			
0800-0900	Costa Rica,RF Peace Intl	6205am	7385am	15050am	
0800-0827	Czech Rep, Radio Prague	7345eu	9505eu		
0800-0900	Ecuador, HCJB	5860eu	9445pa	21455au	
0800-0900 as	Eqt Guinea, R East Africa	15186af			
0800-0900 mtwhf	Eqt Guinea, Radio Africa	15186af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900	Indonesia, Voice of	9525as			
0800-0830 vl	Italy, IRRS	3985va			
0800-0900 vl	Kiribati, Radio	9825do			
0800-0900	Lebanon, Voice of Hope	9960va			
0800-0900	Malaysia, Radio	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295au	
0800-0900	Monaco, Trans World Radio	7115eu			
0800-0825	Netherlands, Radio	9830au	11895pa		
0800-0900	New Zealand, R NZ Intl	9700pa			
0800-0850	North Korea, R Pyongyang	15180as	15230as		
0800-0850	Pakistan, Radio	15470eu	17900eu		
0800-0900 as	Palau, KHBN/Voice of Hope	9730as			
0800-0900 vl	Papua New Guinea, NBC	4890do			
0800-0900	Russia,Voice of Russia WS	7220as	9875pa	12025au	12035as
		15460as			
0800-0810	Sierra Leone, SLBS	3316do			
0800-0900 vl	Solomon Islands, SIBC	5020do	9545do		
0800-0900	South Korea, R Korea Intl	9570au	13670eu		
0800-0820	Swaziland, Trans World R	4775af	6100af	9500af	9650af
0800-0900	United Kingdom, BBC WS	6190af	6195va	7325va	9410eu
		9740as	11760as	11940af	11955as
		12095va	15310as	15485va	15575me
		17640af	17830af	21660as	
0800-0900 as	United Kingdom, BBC WS	15565va			
0800-0900	USA, KAIJ Dallas TX	5810am			
0800-0900	USA, KNLS Anchor Point AK	6150as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	9930as			
0800-0900	USA, Monitor Radio Intl	7535eu	11550pa	15665eu	
0800-0900	USA, WEWN Birmingham AL	5825eu	7425na		
0800-0900	USA, WHRI Noblesville IN	5760am	7315am		
0800-0900	USA, WJCR Upton KY	7490na			
0800-0900 smtwhf	USA, WMLK Bethel PA	9465eu			
0800-0900	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0800-0830 vl	Vanuatu, Radio	3945do	7260do		
0800-0900	Zambia, Christian Voice	6065af			
0800-0805 mtwhfa	Zambia, ZNBC Radio 2	6165do			
0800-0900 vl	Zimbabwe, Zimbabwe BC	5975do			
0803-0810 as	Croatia, Croatian Radio	5895eu	5920eu	7165eu	9830eu
		11635eu	11830eu	13830eu	
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0816-0900 mtwhf	New Zealand, R NZ Intl	9700pa			
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0855	Austria, R Austria Intl	6155eu	13730eu	15240as	17870au
0830-0900	Georgia, Radio	11910eu			
0830-0840	India, All India Radio	7250do	15185do	15260do	
0830-0900 vl	Italy, IRRS	7125va			
0830-0900	Netherlands, Radio	5965pa	9830au	13700pa	
0830-0900	Slovakia, R Slovakia Intl	11990au	17550au	21705au	
0850-0853 s	Russia, R Pacific Ocean	7185as			
0855-0900	Guam, TWR/KTWR	11830au			

FREQUENCIES

0900-1000	Australia, Radio	5995pa	6020pa	6080pa	9510as
		9580pa	9710pa	9860pa	12080pa
		13605as	21725as		
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Canada, CFCX Montreal	6005do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	11755pa	15440pa		
0900-1000	Costa Rica,RF Peace Intl	6205am	7385am		
0900-1000	Ecuador, HCJB	9445pa	21455au		
0900-1000 as	Eqt Guinea, R East Africa	15186af			
0900-1000 mtwhf	Eqt Guinea, Radio Africa	15186af			
0900-0950	Germany, Deutsche Welle	6160pa	7380as	9565af	11715as
		15145af	15410af	17800af	17820pa
		21600af			
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000 m-f/vl	Italy, IRRS	7125va			
0900-1000	Japan, R Japan/NHK World	7125as	11815as	11850au	
0900-0930 vl	Kiribati, Radio	9825do			
0900-1000	Lebanon, Voice of Hope	9960va			
0900-1000	Malaysia, Radio	7295do			
0900-0920 mtwhf	Monaco, Trans World Radio	7115eu			
0900-0905 a	Monaco, Trans World Radio	7115eu			
0900-0925	Netherlands, Radio	5965pa	9830au	13700pa	
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-0930 s	Norway, Radio Norway Intl	13800au	15220me		
0900-1000 as	Palau, KHBN/Voice of Hope	9730as			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Russia,Voice of Russia WS	7220as	9675pa	9835au	9875au
		17860au			
0900-0930	Switzerland, Swiss R Intl	9885pa	12075au	13685pa	
0900-1000	United Kingdom, BBC WS	6190af	6195as	9410eu	11750as
		11940af	12095eu	15190sa	15280as
		15360as	15400af	15485va	15565va
		15575me	17640af	17705eu	17830af
		17885af			
0900-0915	United Kingdom, BBC WS	6065as	7325va	9580as	11760as
		11955as	15310as		
0900-1000	USA, KAIJ Dallas TX	5810am			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, Monitor Radio Intl	7395sa	7535eu	9430as	13840au
0900-1000	USA, WEWN Birmingham AL	5825eu	7425na		
0900-1000	USA, WHRI Noblesville IN	5760am	7315am	9930am	
0900-1000	USA, WJCR Upton KY	7490na			
0900-1000 smtwhf	USA, WMLK Bethel PA	9465eu			
0900-1000 as	USA, WVHA Greenbush ME	13825af			
0900-1000	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0900-1000	Zambia, Christian Voice	6065af			
0900-1000 vl	Zimbabwe, Zimbabwe BC	5975do			
0903-0910 mtwhf	Croatia, Croatian Radio	5895eu	5920eu	7165eu	9830eu
		11635eu	11830eu	13830eu	
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0930-1000 s	Armenia, Voice of	15270eu			
0930-1000	Canada, CKZN St John's	6160do			
0930-0955	Georgia, Radio	11910eu			
0930-1000	Netherlands, Radio	5965as	7260as	9810as	9830au
0930-1000	Philippines, FEBC/R Intl	11635as			

1000 UTC

1000-1100	Australia, Radio	5995as	6020pa	6080pa	9510as
		9580pa	9860pa	13605as	21725as
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1025 mtwhfa	Belgium, R Vlaanderen Int	6035eu			
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFCX Montreal	6005do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	11755pa	15440pa		
1000-1100	Costa Rica,RF Peace Intl	6205am	7385am		
1000-1030	Czech Rep, Radio Prague	17485af	21705me		
1000-1100	Ecuador, HCJB	9445pa	21455au		
1000-1100 as	Eqt Guinea, R East Africa	15186af			
1000-1100 mtwhf	Eqt Guinea, Radio Africa	15186af			
1000-1100	Guam, TWR/KTWR	9870as			
1000-1100	India, All India Radio	11585as	13700as	15050as	17387au
		17840as			
1000-1100 vl	Italy, IRRS	7125va			
1000-1100	Lebanon, Voice of Hope	9960va			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			
1000-1100 vl	Malaysia,RTM KotaKinabalu	5980do			
1000-1025	Netherlands, Radio	5965pa	7260as	9810as	9830au
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100 as	Palau, KHBN/Voice of Hope	9730as			
1000-1100 vl	Papua New Guinea, NBC	4890do			
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Russia,Voice of Russia WS	7150va	7220as	9675pa	9835pa
		9875au	11655as	11800as	12025as
		13785as	15490as	15560as	15580as
		17755as	17860as		
1000-1100	United Kingdom, BBC WS	6190af	6195am	9410eu	9740as
		11760as	11940af	12095eu	15280as
		15310as	15360as	15485va	15565va
		15575va	17640va	17705va	17790as
		17885af	21660as		
1000-1100 as	United Kingdom, BBC WS	15190am	15400am	17830af	
1000-1100	USA, KAIJ Dallas TX	5810am			
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	9930as			
1000-1100	USA, Monitor Radio Intl	6095na	7395sa	9430as	13840as
1000-1100	USA, Voice of America	5985pa	6165am	7405am	9590am
		11720pa	15425pa		
1000-1100	USA, WEWN Birmingham AL	7425na	15665eu		
1000-1100	USA, WGTG McCaysville GA	9400am			
1000-1100	USA, WHRI Noblesville IN	6040am	9495am	9930am	
1000-1100	USA, WJCR Upton KY	7490na			
1000-1100	USA, WMLK Bethel PA	9465eu			
1000-1100 as	USA, WVHA Greenbush ME	13825af			
1000-1100	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1100 vl/m-f	Vatican State, Vatican R	11740af	15210af	17550af	
1000-1030	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as	15010as		
1000-1100	Zambia, Christian Voice	6065af			
1000-1005 mtwhfa	Zambia, ZNBC Radio 2	6165do			
1030-1055 mtwhfa	Austria, R Austria Intl	6155eu	13730eu	15240as	17870au
1030-1100	Guam, AWR/KSDA	9870as			
1030-1100	Netherlands, Radio	7260as	9810as		
1030-1100	Sri Lanka, Sri Lanka BC	11835as	17850as		
1030-1055	UAE, Radio Dubai	13675eu	15395eu	17825eu	21605me

HAUSER'S HIGHLIGHTS

CHINA: CHINA RADIO INTERNATIONAL

English Programs

Daily	*News, Commentaries,*
Mon-Fri	*Current Affairs, Press Clippings*
Sun	*Sports Beat, Snap Shots, In the Third World, Song of the Week, Listeners' Letterbox*
Mon	*Open Windows, Learn to Speak Chinese*
Tue	*Orient Arena, Listeners' Letterbox* repeat
Wed	*Profile, Learn to Speak Chinese*
Thu	*Focus, Cultural Spectrum*
Fri	*Life in China, Global Review*
Sat	*Asia-Pacific News, Trvel Talk, Cooking Show, China Scrapbook, Music from China*

(CRI via Gigi Lytle, Bob Thomas)

Frequencies

1100-1200	Australia, Radio	9580pa	9615as	9860pa	12080pa
		13605as	21725as		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Canada, CFCX Montreal	6005do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, Adv World R	7375am	9725am	13750am	
1100-1200	Costa Rica,RF Peace Intl	6205am	7385am		
1100-1200	Ecuador, HCJB	12005am	15115am	21455au	
1100-1200 as	Eqt Guinea, R East Africa	15186af			
1100-1200	Eqt Guinea, Radio Africa	9530as			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17780af	17800af
1100-1200 vl	Italy, IRRS	7125va			
1100-1200	Japan, R Japan/NHK World	6120na	7125na	11815as	
1100-1200	Lebanon, Voice of Hope	9960va			
1100-1200	Malaysia, Radio	7295do			
1100-1200 vl	Malaysia, RTM Kuching	7160do			
1100-1200 vl	Malaysia,RTM KotaKinabalu	5980do			
1100-1125	Netherlands, Radio	7260as	9810as		
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1150	North Korea, R Pyongyang	6575na	9975na	11335na	
1100-1120	Pakistan, Radio	15470eu	17900eu		
1100-1130 as	Palau, KHBN/Voice of Hope	9730as			
1100-1200 vl	Papua New Guinea, NBC	4890do			
1100-1200	Russia,Voice of Russia WS	9705as	11655as	13785as	15120as
		15460as	15490as	15560as	17755as
		17860as			
1100-1200	Singapore,R Singapore Int	6015as	6155as		
1100-1130	Sri Lanka, Sri Lanka BC	11835as	17850as		
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu	9885as	11995as
		13635as			
1100-1200	Taiwan, Voice of Asia	9280as			
1100-1200	United Kingdom, BBC WS	5965am	6190af	9410eu	11750as
		11760as	11940af	12095eu	15220am
		15310as	15485va	15565va	15575va
		17640af	17790as	17830af	17885af
		21660af			
1100-1130 as	United Kingdom, BBC WS	15190am			
1100-1130	United Kingdom, BBC WS	6195am	9700as	15400af	
1100-1200	USA, KAIJ Dallas TX	5810am	9815am		
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	9930as			
1100-1200	USA, Monitor Radio Intl	6095na	7395sa	9355eu	9430au
1100-1200	USA, Voice of America	5985as	6110as	9645as	9760as
		11705as	11720as	15425as	
1100-1200	USA, WEWN Birmingham AL	7425na	15665eu		
1100-1200	USA, WGTG McCaysville GA	9400am			
1100-1200	USA, WHRI Noblesville IN	6040am	9495am	9930am	
1100-1200	USA, WJCR Upton KY	7490na			
1100-1200 as	USA, WVHA Greenbush ME	13825af			
1100-1200	USA, WWCR Nashville TN	5070am	5935am	9475am	15685am
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1100-1200 vl/m-f	Vatican State, Vatican R	5880eu			
1100-1130	Vietnam, Voice of	7285as	9730as		
1100-1200	Zambia, Christian Voice	6065af			
1115-1127	Zambia, ZNBC Radio 1	7220do			
1115-1200	Zambia, ZNBC Radio 2	6165do			
1130-1200	Bulgaria, Radio	9440as			
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu		
1130-1200	Finland, YLE/R Finland	15245as	17685au		
1130-1200	Iran, VOIRI	11875me	11930me	15260af	
1130-1200	Myanmar, Voice of	5990do			
1130-1200	Netherlands, Radio	6045eu	7190eu		
1130-1200	South Korea, R Korea Intl	9650am			
1130-1200	United Kingdom, BBC WS	17705va			
1130-1200 f	Vatican State, Vatican R	15595as	17550au		
1135-1140	India, All India Radio	9595do	11620do	11710do	15185do

Selected Programs

Sundays

1100 Ecuador, HCJB Quito (am): Morning Song. Music and thoughts to start the day.
1100 Japan, NHK/Radio: News. World news from NHK International.
1110 Japan, NHK/Radio: Hello from Tokyo. The weekend magazine program.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Ecuador, HCJB Quito (am): The Christian's Hour. Christian messages of inspiration by Gary York.
1134 Czech Rep, Radio Prague: The Week in Politics. A wrap-up of the previous week's political affairs.
1143 Czech Rep, Radio Prague: From the Weeklies. Items and editorial opinion from the weekend Czech papers.
1149 Czech Rep, Radio Prague: Media Check. News items and editorial comment from foreign press, television, and radio.
1155 Japan, NHK/Radio: News Summary. A five-minute news wrap-up.

Mondays

1100 Ecuador, HCJB Quito (am): Morning in the Mountains. A light-hearted hour of music, conversation, news, and devotional features hosted by Dan Wales and Tania Manners.
1100 Japan, NHK/Radio: Radio Japan News Round. Thirty minutes of world, regional, and Japanese news.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Japan, NHK/Radio: Close Up. Featuring a Japanese person of note.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. The weekday magazine program of feature reports and the popular vocal music of Japan.
1135 Czech Rep, Radio Prague: Current Affairs. People and events in the Czech Republic and editorial commentary.
1138 Czech Rep, Radio Prague: Press Review. News items and editorial comment from the Czech newspapers.
1140 Japan, NHK/Radio: Sports. A roundup of regional sports news.
1141 Czech Rep, Radio Prague: Magazine '96. Music and interviews about current Czech affairs.
1145 Japan, NHK/Radio: Weekly Column. See S 2350.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Tuesdays

1100 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Japan, NHK/Radio: Close Up. See M 1130.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 1130.
1134 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1141 Czech Rep, Radio Prague: Talking Point. Discussion of a topic of concern to the Czech people.
1145 Japan, NHK/Radio: Japanese Culture Today. Comparing modern-day Japan with the customs of old.
1153 Czech Rep, Radio Prague: Media Check. See S 1149.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Wednesdays

1100 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Japan, NHK/Radio: Close Up. See M 1130.
1130 Japan, NHK/Radio: Close Up. See M 1130.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 1130.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 1130.
1135 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1138 Czech Rep, Radio Prague: Press Review. See M 1138.
1141 Czech Rep, Radio Prague: From the Archives. An historical look at the Czech people and their lifestyle.
1141 Japan, NHK/Radio: Asian Report. Current events in the Asia-Pacific region.
1145 Japan, NHK/Radio: Asian Report. See W 1141.
1148 Czech Rep, Radio Prague: The Arts. Focus on an a particular topic concerning Czech art.
1155 Japan, NHK/Radio: News Summary. See S 1155.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Thursdays

1100 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1120 Ecuador, HCJB Quito (am): Guidelines. See M 1246.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Japan, NHK/Radio: Close Up. See M 1130.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 1130.
1136 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1142 Czech Rep, Radio Prague: Press Review. See M 1138.
1144 Czech Rep, Radio Prague: Economic Report. Czech financial news.
1145 Japan, NHK/Radio: Crosscurrents. Radio Japan's mailbag program.
1150 Czech Rep, Radio Prague: I'd Like You to Meet. A studio interview with an interesting Czech personality.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Fridays

1100 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1100 Japan, NHK/Radio: Radio Japan News Round. See M 1100.
1106 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1109 Czech Rep, Radio Prague: Press Review. See M 1138.
1112 Czech Rep, Radio Prague: Between You and Us. Information about the Czech Republic, commentary on listener letters, and occasional DX news.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Japan, NHK/Radio: Close Up. See M 1130.
1130 Japan, NHK/Radio: Radio Japan Magazine Hour. See M 1130.
1145 Japan, NHK/Radio: Business Focus. A segment of the Magazine Hour which spotlights an aspect of business in Japan.
1154 Radio Netherlands: Documentary. Childless by Choice (21th). See F 1454.
1154 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (7th). See W 1254.
1154 Radio Netherlands: Documentary. Spanish Catholicism in Flux (28th). See F 2354.
1154 Radio Netherlands: Documentary. The Titantic: Encore (14th). See A 2354.
1155 Japan, NHK/Radio: News Summary. See S 1155.

Saturdays

1100 Ecuador, HCJB Quito (am): Hour of Decision. See M 0005.
1100 Japan, NHK/Radio: News. See S 1100.
1110 Japan, NHK/Radio: This Week. A weekly variety show.
1130 Czech Rep, Radio Prague: News. See S 0000.
1130 Ecuador, HCJB Quito (am): We Kids. A fast-moving program for children.
1135 Czech Rep, Radio Prague: Live in Prague. See S 0005.
1155 Japan, NHK/Radio: News Summary. See S 1155.

1200 UTC SHORTWAVE GUIDE 7:00 AM EST 4:00 AM PST

Frequencies

1200-1300	Australia, Radio	7150as	9580pa	9615as	9710as
		9770as	9860pa	11660as	11800pa
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Brazil, Radio Bras	15445na			
1200-1230	Bulgaria, Radio	9440as			
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFCX Montreal	6005do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1230	Canada, R Canada Intl	6150as	11730as		
1200-1300	China, China Radio Intl	7385na	9565as	9715as	11660as
		11795pa	15440am		
1200-1230 vl	China, China Radio Intl	6995as	11700as	12110as	
1200-1300	Costa Rica, Adv World R	5030am	6150am	9725am	13750am
1200-1300	Ecuador, HCJB	12005am	15115am	21455am	
1200-1300 as	Eqt Guinea, R East Africa	15186af			
1200-1300	Eqt Guinea, Radio Africa	9530as			
1200-1300	France, Radio France Intl	11600va	11615va	15155eu	15195eu
		15530af	15540am		
1200-1230	Iran, VOIRI	11875me	11930me	15260af	
1200-1300 vl	Italy, IRRS	7125va			
1200-1300	Jordan, Radio	11690eu			
1200-1300	Lebanon, Voice of Hope	9960va			
1200-1300	Malaysia, Radio	7295do			
1200-1300 vl	Malaysia,RTM KotaKinabalu	5980do			
1200-1250	Myanmar, Voice of	5990do			
1200-1300	Netherlands, Radio	6045eu	7190eu		
1200-1206	New Zealand, R NZ Intl	9700pa			
1200-1300	Russia,Voice of Russia WS	9725as	9755as	9820as	9875as
		11655as	11880as	13785as	15120as
		17755as	17860as		
1200-1300	Singapore,R Singapore Int	6015as	6155as		
1200-1300	South Korea, R Korea Intl	7285af			
1200-1300	Taiwan, VO Free China	7130au	9610as		

1200-1300	United Kingdom, BBC WS	5965am	6055as	6190af	6195va
		9410eu	9580as	9740va	11750as
		11760as	11940af	11955as	15310as
		15485va	15565va	15575me	17640af
		17705va	17830af	17885af	21660af
1200-1215	United Kingdom, BBC WS	15220am			
1200-1300	USA, KAIJ Dallas TX	5810am			
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	9930as			
1200-1300	USA, Monitor Radio Intl	6095na	9355as	9430au	9455sa
1200-1300	USA, Voice of America	6110as	9760as	11705as	11715as
		15425as			
1200-1300	USA, WEWN Birmingham AL	7425na	15665eu		
1200-1300	USA, WHRI Noblesville IN	6040am	9495am		
1200-1300	USA, WJCR Upton KY	7490na			
1200-1300 as	USA, WVHA Greenbush ME	13825eu			
1200-1300	USA, WWCR Nashville TN	5935am	7435am	9475am	15685am
1200-1300	USA, WYFR Okeechobee FL	5950na	11830na	11970na	
1200-1245	USA, WYFR Okeechobee FL	7355na			
1200-1230	Uzbekistan, R Tashkent	5060as	5975as	6025as	7285as
		9715as			
1200-1300	Zambia, Christian Voice	6065af			
1200-1300 mtwhf	Zambia, ZNBC Radio 2	6165do			
1206-1300 occsnal	New Zealand, R NZ Intl	6105pa			
1215-1300	Egypt, Radio Cairo	17595as			
1230-1300 as	Australia, Radio	5995pa			
1230-1300	Bangladesh,Bangla Betar	7185as	9548as		
1230-1300 mtwhf	Finland, YLE/R Finland	11735na	15400na		
1230-1300	Georgia, Radio	6080eu			
1230-1235	India, All India Radio	4860do	6185do	17865do	
1230-1300 w	Indonesia, RRI Sorong	4875do			
1230-1300 a	Monaco, Trans World Radio	7115eu			
1230-1255 s	Monaco, Trans World Radio	7115eu			
1230-1300	South Korea, R Korea Intl	9570as	9640as	13670as	
1230-1300 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1230-1300	Sweden, Radio	11650na	15240na		
1230-1300	Thailand, Radio	9505as	9655as	9810as	
1230-1300 s	USA, WRMI/R Miami Intl	9955am			
1230-1300	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as	15010as		
1240-1250	Greece, Voice of	11645af	15650af	17525af	

Selected Programs

Sundays

1200 Ecuador, HCJB Quito (am): Kids' Corner. Mr Lizard and friends present a program for children.
1200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 0203.
1215 Taiwan, V of Free China: People. See S 0215.
1230 Ecuador, HCJB Quito (am): Your Story Hour. Dramatized children's stories.
1231 Taiwan, V of Free China: Mailbag Time. See S 0231.
1247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Mondays

1200 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 0203.
1204 Ecuador, HCJB Quito (am): News. See S 0100.
1215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
1220 Ecuador, HCJB Quito (am): Insight. A few minutes of discernment from Joel Niederhood.
1230 Ecuador, HCJB Quito (am): Latin News. Regional news summary.
1238 Ecuador, HCJB Quito (am): A Reading from God's Word. A short break for bible reading.
1246 Ecuador, HCJB Quito (am): Guidelines. A five-minute commentary on living from Harold Sala. (www.guidelines.org)
1247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Tuesdays

1200 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1200 Taiwan, V of Free China: Frequency Announcements/ Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 0203.
1204 Ecuador, HCJB Quito (am): News. See S 0100.
1215 Taiwan, V of Free China: Taiwan Today. See T 0215.
1220 Ecuador, HCJB Quito (am): Insight. See M 1220.
1230 Ecuador, HCJB Quito (am): Latin News. See M 1230.
1230 Taiwan, V of Free China: Journey into Chinese Culture. See T 0230.
1238 Ecuador, HCJB Quito (am): A Reading from God's Word. See M 1238.
1246 Ecuador, HCJB Quito (am): Guidelines. See M 1246.
1249 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Wednesdays

1200 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 020-.
1204 Ecuador, HCJB Quito (am): News. See S 0100.
1215 Taiwan, V of Free China: Music Box. See W 0215.
1220 Ecuador, HCJB Quito (am): Insight. See M 1220.
1230 Ecuador, HCJB Quito (am): Latin News. See M 1230.
1238 Ecuador, HCJB Quito (am): A Reading from God's Word. See M 1238.
1246 Ecuador, HCJB Quito (am): Guidelines. See M 1246.
1251 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.
1254 Radio Netherlands: Documentary. Childless by Choice (19th). See F 1454.
1254 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (5th). As Radio Netherlands celebrates its 50th anniversary this year, Pete Myers and Luc Lucas tell the fascinating story.
1254 Radio Netherlands: Documentary. Spanish Catholicism in Flux (26th). See F 2354.
1254 Radio Netherlands: Documentary. The Titantic: Encore (12th). See A 2354.

Thursdays

1200 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 0203.
1204 Ecuador, HCJB Quito (am): News. See S 0100.
1215 Taiwan, V of Free China: Jade Bells and Bamboo Pipes. See M 0215.
1220 Ecuador, HCJB Quito (am): Insight. See M 1220.
1230 Ecuador, HCJB Quito (am): Latin News. See M 1230.
1238 Ecuador, HCJB Quito (am): A Reading from God's Word. See M 1238.
1246 Ecuador, HCJB Quito (am): Guidelines. See M 1246.
1248 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Fridays

1200 Ecuador, HCJB Quito (am): Morning in the Mountains. See M 1100.
1200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 0203.
1204 Ecuador, HCJB Quito (am): News. See S 0100.
1215 Taiwan, V of Free China: Perspective. See F 0215.
1220 Ecuador, HCJB Quito (am): Insight. See M 1220.
1230 Ecuador, HCJB Quito (am): Latin News. See M 1230.
1233 Taiwan, V of Free China: New Record Time. See F 0233.
1238 Ecuador, HCJB Quito (am): A Reading from God's Word. See M 1238.
1246 Ecuador, HCJB Quito (am): Guidelines. See M 1246.
1247 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Saturdays

1200 Ecuador, HCJB Quito (am): A Visit With Mrs. G. Bible stories for children.
1200 Taiwan, V of Free China: Frequency Announcements/Anthem. See S 0200.
1203 Taiwan, V of Free China: News. See S 0203.
1215 Ecuador, HCJB Quito (am): Adventure Pals. A weekly adventure program on Christianity for children.
1215 Taiwan, V of Free China: Kaleidoscope. See S 0315.
1230 Ecuador, HCJB Quito (am): Adventures in Odyssey. See S 0000.
1232 Taiwan, V of Free China: Reflections. See S 0332.
1248 Taiwan, V of Free China: Let's Learn Chinese. See S 0247.

Frequencies

1300-1400	Australia, Radio	5995pa	9580pa	9615as	11800pa
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VI8T Tent Crk	2325do			
1300-1320	Brazil, Radio Bras	15445na			
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFCX Montreal	6005do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1400	Canada, R Canada Intl	9640am	11855am		
1300-1400	China, China Radio Intl	7385na	7410as	9715as	11660pa
1300-1400	Costa Rica,RF Peace Intl	6205am	7385am		
1300-1400	Ecuador, HCJB	12005am	15115am	21455am	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400 as	Eqt Guinea, R East Africa	15186af			
1300-1400	Eqt Guinea, Radio Africa	9530as			
1300-1400 vl	Italy, IRRS	7125va			
1300-1400	Jordan, Radio	11690eu			
1300-1400	Malaysia, Radio	7295do			
1300-1400 vl	Malaysia, RTM Kuching	7160do			
1300-1400 vl	Malaysia,RTM KotaKinabalu	5980do			
1300-1400 occsnal	New Zealand, R NZ Intl	6105pa			
1300-1350	North Korea, R Pyongyang	9345as	9640eu	11740as	15230as
		15430as			
1300-1330 s	Norway, Radio Norway Intl	9590eu	9905as	11840na	15605au
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1355	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9525eu
		11815eu			
1300-1400	Romania, R Romania Intl	9683eu	11940eu	15390eu	17745eu
1300-1400	Russia,Voice of Russia WS	4740as	4975as	9705as	15460as
		17860as			
1300-1400	Singapore,R Singapore Int	6015as	6155as		
1300-1400 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1300-1330	Switzerland, Swiss R Intl	7230as	7480as	12075as	13635as
1300-1400	Switzerland, Swiss R Intl	6165eu	9535eu		
1300-1400	United Kingdom, BBC WS	5965am	5990as	6065as	6190af
		6195va	9410eu	9515am	9580as
		9590am	11750as	11760as	11940af
		12095eu	12220am	15310as	15420af
		15485va	15565va	15575me	17640va
	17705va	17830af	17885af	21660af	
1300-1400	USA, KAIJ Dallas TX	5810am			
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, KWHR Naalehu HI	9930as			
1300-1400	USA, Monitor Radio Intl	6095na	9355as	9455am	13840as
1300-1400	USA, Voice of America	6110as	9645as	9760as	11705as
		11715as	15425as		
1300-1400	USA, WEWN Birmingham AL	7425na	11875na	15665eu	
1300-1400	USA, WGTG McCaysville GA	9400am			
1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	USA, WJCR Upton KY	7490na			
1300-1400 s	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WWCR Nashville TN	5935am	7435am	9475am	
1300-1400	USA, WYFR Okeechobee FL	5950na	11830na	13695na	
1300-1345	USA, WYFR Okeechobee FL	11970am			
1300-1400	Zambia, Christian Voice	6065af			
1300-1330 mtwhf	Zambia, ZNBC Radio 2	6165do			
1303-1010	Croatia, Croatian Radio	5895eu	5920eu	7165eu	9830eu
		11635eu	11830eu	13830eu	
1315-1400 mtwhfa	Bhutan, Bhutan BC Service	5023do			
1330-1355	Austria, R Austria Intl	6155eu	13730na		
1330-1355 s	Belgium, R Vlaanderen Int	13685va	13795va		
1330-1357	Canada, R Canada Intl	6150as	9535as		
1330-1400	Finland, YLE/R Finland	11735na	15400na		
1330-1400	Guam, AWR/KSDA	9650as			
1330-1400	India, All India Radio	11620as	13750as		
1330-1400	Mongolia, R Ulan Bator	12085as			
1330-1400	Netherlands, Radio	9895as	13700as	15585as	
1330-1400 vl	Pakistan, Radio	9900af	11570me		
1330-1400	Sweden, Radio	7155as	15240pa		
1330-1400	Turkey, Voice of	9445eu	9630as		
1330-1355	UAE, Radio Dubai	13665eu	15395eu	17630eu	21605me
1330-1400 mtwhf	USA, WRMI/R Miami Intl	9955am			
1330-1400	Uzbekistan, R Tashkent	5975as	7285as	9715as	
1330-1400	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
		12020eu	15010eu		
1330-1400	Yugoslavia, Radio	11835eu			
1345-1400	Vatican State, Vatican R	9500as	11625as		

Selected Programs

Sundays

1300 Ecuador, HCJB Quito (am): Simply Worship. A Northern Ireland program of music, readings and meditation.
1300 Switzerland, Swiss R Intl: News. Five minutes of world news.
1300 USA, Monitor Radio Intl: Bible Lesson. Lesson-sermons from the King James Version of the Bible and Mary Baker Eddy's textbook.
1305 Switzerland, Swiss R Intl: Newsnet. Ten minutes of comment and backgrounders from correspondents; 15 minutes on what's happening in Switzerland.
1329 USA, Monitor Radio intl: Christian Science Sentinel Radio Edition. Discussions on how the Bible addresses the trends of thought of today.
1330 Ecuador, HCJB Quito (am): Mountain Meditations. A mixture of music and devotional thoughts in an Andean setting.

Mondays

1300 Ecuador, HCJB Quito (am): Let My People Think. See S 1530.
1300 Switzerland, Swiss R Intl: News. See S 1300.
1300 USA, Monitor Radio Intl: Monitor Radio News. Five minutes of the latest world news at the beginning of the hour.
1305 Switzerland, Swiss R Intl: Newsnet. See S 1305.
1306 USA, Monitor Radio Intl: Monitor Radio International. News, analysis, commentary, interviews and features in a magazine format.
1330 Ecuador, HCJB Quito (am): Focus on the Family. Psychologist James Dobson on everyday family matters. (www.webcom.com/dms/focus.html)
1349 USA, Monitor Radio Intl: Letterbox. Listeners make their views known by telephone or letter to host Lisa Dale.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. As published in the christian Science Monitor.

Tuesdays

1300 Ecuador, HCJB Quito (am): The Living Word. A sermon from Southeast Christian Church of Louisville, Kentucky.
1300 Switzerland, Swiss R Intl: News. See S 1300.
1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1305 Switzerland, Swiss R Intl: Newsnet. See S 1305.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1306.
1330 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.
1349 USA, Monitor Radio Intl: Letterbox. See M 1349.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1352.

Wednesdays

1300 Ecuador, HCJB Quito (am): Back to God Hour. The Christian Reformed Church looks at life in light of the historic Christian faith.
1300 Switzerland, Swiss R Intl: News. See S 1300.
1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1305 Switzerland, Swiss R Intl: Newsnet. See S 1305.
1306 USA, Monitor Radio Intl: Monitor Radio Interna, onal. See M 1306.
1330 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.
1349 USA, Monitor Radio Intl: Letterbox. See M 1349.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1352.
1354 Radio Netherlands: Documentary. Childless by Choice (19th). See F 1454.
1354 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (5th). See W 1254.
1354 Radio Netherlands: Documentary. Spanish Catholicism in Flux (26th). See F 2354.
1354 Radio Netherlands: Documentary. The Titantic: Encore (12th). See A 2354.

Thursdays

1300 Ecuador, HCJB Quito (am): Christian Brotherhood Hour. Music and messages of inspiration from Christians Broadcasting Hope, the radio ministry of Church of God.
1300 Switzerland, Swiss R Intl: News. See S 1300.
1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1305 Switzerland, Swiss R Intl: Newsnet. See S 1305.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1306.
1330 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.
1349 USA, Monitor Radio Intl: Letterbox. See M 1349.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1352.

Fridays

1300 Ecuador, HCJB Quito (am): Haven of Rest. Evangelizing and The Haven Quartet.
1300 Switzerland, Swiss R Intl: News. See S 1300.
1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1305 Switzerland, Swiss R Intl: Newsnet. See S 1305.
1306 USA, Monitor Radio Intl: Monitor Radio International. See M 1306.
1330 Ecuador, HCJB Quito (am): Focus on the Family. See M 1330.
1349 USA, Monitor Radio Intl: Letterbox. See M 1349.
1352 USA, Monitor Radio Intl: Religious Article from the CSM. See M 1352.

Saturdays

1300 Ecuador, HCJB Quito (am): Children's Bible Hour. Songs and stories for children. (www.gospelcom.net/cbh/)
1300 Switzerland, Swiss R Intl: News. See S 1300.
1300 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1305 Switzerland, Swiss R Intl: Newsnet. See S 1305.
1306 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1329.
1315 Switzerland, Swiss R Intl: Capital Letters (2/4). SRI's bimonthly mailbag and listener contact program.
1315 Switzerland, Swiss R Intl: Sounds Good (3/5). Music from Switzerland and the people who make it.
1315 Switzerland, Swiss R Intl: The Name Game (1). A chance for you to test your knowledge of Switzerland and win prizes.
1330 Ecuador, HCJB Quito (am): Jungle Jam and Friends. A program for children.

Frequencies

1400-1500	Algeria, R Algiers Intl	11715eu	15160eu	15205eu	
1400-1500	Australia, Radio	5995pa	9580pa	9860pa	11660as
		11800pa	12080pa		
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VI8T Tent Crk	2325do			
1400-1425 mtwhfa	Belgium, R Vlaanderen Int	13685na	13795as		
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFCX Montreal	6005do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1500 s	Canada, R Canada Intl	9640am	11855am		
1400-1500	China, China Radio Intl	7405na	9535as	9785as	
1400-1500	Costa Rica,RF Peace Intl	7385am	15050am		
1400-1430	Czech Rep, Radio Prague	13580eu	17845af		
1400-1500	Ecuador, HCJB	12005am	15115am	21455am	
1400-1500 as	Eqt Guinea, R East Africa	15186af			
1400-1500	France, Radio France Intl	7110as	12030af	17560me	
1400-1500	India, All India Radio	11620as	13750as		
1400-1430 vl	Italy, IRRS	7125va			
1400-1500	Japan, R Japan/NHK World	7125na	7200na	9535na	11705na
		11880as	11895as		
1400-1500	Jordan, Radio	11690eu			
1400-1500	Malaysia, Radio	7295do			
1400-1500 vl	Malaysia, RTM Kuching	7160do			
1400-1500 vl	Malaysia,RTM KotaKinabalu	5980do			
1400-1500	Netherlands, Radio	9895as	13700as	15585as	
1400-1500 occsnal	New Zealand, R NZ Intl	6105pa			
1400-1430 s	Norway, Radio Norway Intl	11730as	11840as	11850as	
1400-1410	Pakistan, Radio	9900as	11570me		
1400-1430 as	Palau, KHBN/Voice of Hope	9730as			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia,Voice of Russia WS	7130me	7165me	9470me	9840me
		15205me			
1400-1500	Sri Lanka, Sri Lanka BC	9730as			
1400-1430	Thailand, Radio	9530as	9655as	11905as	
1400-1430	Turkey, Voice of	9445eu	9630as		
1400-1500	United Kingdom, BBC WS	5990as	6190af	6195as	9410eu
		9515am	9590am	11750as	11940af
		12095eu	15220am	15310as	15485va
		15565va	15575me	17640va	17705va
1400-1500	USA, KAIJ Dallas TX	13815am			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, Monitor Radio Intl	9355as			
1400-1500	USA, Voice of America	6110as	7125as	7215as	9645as
		9760as	11705as	15205me	15395as
		15425as			
1400-1500	USA, WEWN Birmingham AL	9455na	11875na	15665eu	
1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WJCR Upton KY	7490na			
1400-1500 mtwhf	USA, WRMI/R Miami Intl	9955am			
1400-1500 s	USA, WRMI/R Miami Intl	9955am			
1400-1500	USA, WRNO New Orleans LA	15420am			
1400-1500 as	USA, WVHA Greenbush ME	15745na			
1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500	USA, WYFR Okeechobee FL	5950na	11830na	17760eu	
1400-1405	Vatican State, Vatican R	9500as	11625as		
1400-1500	Zambia, Christian Voice	6065af			
1400-1405 mtwhf	Zambia, ZNBC Radio 2	6165do			
1415-1425	Nepal, Radio	7165do			
1430-1500	Canada, R Canada Intl	9555me	11915af	11935me	15325me
1430-1500 vl	China, China Radio Intl	6995as	8660as	9880as	11445as
1430-1500	Guam, AWR/KSDA	7395as			
1430-1440	India, All India Radio	3945do	6185do	9565do	9685do
1430-1440 mtwhf	Indonesia, RRI Uj Pandang	4753do			
1430-1500 vl	Italy, IRRS	3985va			
1430-1500 mtwhf	Portugal, R Portugal Intl	21515me			
1430-1500	Romania, R Romania Intl	11740as	15335as		
1430-1500	Sweden, Radio	9485as	9885na	11650na	15240na
1430-1500	United Kingdom, BBC WS	15400af	17830af	21660af	
1435-1445	Greece, Voice of	11645na	15175na		
1440-1500	Myanmar, Voice of	5990do			

Selected Programs

Sundays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Radio Bible Class. Bible teaching and the Men of Praise providing the music.
1404 Czech Rep, Radio Prague: The Week in Politics. See S 1134.
1413 Czech Rep, Radio Prague: From the Weeklies. See S 1143.
1419 Czech Rep, Radio Prague: Media Check. See S 1149.
1430 Ecuador, HCJB Quito (am): Moody Presents. Christian messages from the Moody Bible Institute. (www.moody.edu)
1445 Guam, AWR/KSDA: Voice of Prophecy. Write for an adult bible study program.

Mondays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Gateway to Joy. Elizabeth Elliot with contemporary women's issues from a Biblical perspective. (www.gospelcom.net/bttb/fob-gtj.html)
1405 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1408 Czech Rep, Radio Prague: Press Review. See M 1138.
1411 Czech Rep, Radio Prague: Magazine '96. See M 1141.
1415 Ecuador, HCJB Quito (am): Key Life. Steve Brown presents truthful teachings.
1430 Ecuador, HCJB Quito (am): Insight for Living. Chuck Swindoll applies the Bible to life today. (www.insight.org)
1430 Guam, AWR/KSDA: Music. Recorded selections of Christian music.
1435 Guam, AWR/KSDA: Focus on Living. Australian-produced program of advice for the family.
1445 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.

Tuesdays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
1404 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1411 Czech Rep, Radio Prague: Talking Point. See T 1141.
1415 Ecuador, HCJB Quito (am): Key Life. See M 1415.
1423 Czech Rep, Radio Prague: Media Check. See S 1149.
1430 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
1430 Guam, AWR/KSDA: Music. See M 1430.
1435 Guam, AWR/KSDA: Focus on Living. See M 1435.
1445 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.

Wednesdays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
1405 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1408 Czech Rep, Radio Prague: Press Review. See M 1138.
1411 Czech Rep, Radio Prague: From the Archives. See W 1141.
1415 Ecuador, HCJB Quito (am): Key Life. See M 1415.
1418 Czech Rep, Radio Prague: The Arts. See W 1148.
1430 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
1430 Guam, AWR/KSDA: Music. See M 1430.
1435 Guam, AWR/KSDA: Focus on Living. See M 1435.
1445 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.

Thursdays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
1406 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1412 Czech Rep, Radio Prague: Press Review. See M 1138.
1414 Czech Rep, Radio Prague: Economic Report. See H 1144.
1415 Ecuador, HCJB Quito (am): Key Life. See M 1415.
1420 Czech Rep, Radio Prague: I'd Like You to Meet. See H 1150.
1430 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
1430 Guam, AWR/KSDA: Music. See M 1430.
1435 Guam, AWR/KSDA: Focus on Living. See M 1435.
1445 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.

Fridays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Gateway to Joy. See M 1400.
1406 Czech Rep, Radio Prague: Current Affairs. See M 1135.
1409 Czech Rep, Radio Prague: Press Review. See M 1138.
1412 Czech Rep, Radio Prague: Between You and Us. See F 1112.
1415 Ecuador, HCJB Quito (am): Key Life. See M 1415.
1430 Ecuador, HCJB Quito (am): Insight for Living. See M 1430.
1430 Guam, AWR/KSDA: Music. See M 1430.
1435 Guam, AWR/KSDA: Focus on Living. See M 1435.
1445 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.
1454 Radio Netherlands: Documentary. Childless by Choice (21th). Helen Barrington talks to people from a variety of countries about their reasons for not wanting to have children.
1454 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (7th). See W 1254.
1454 Radio Netherlands: Documentary. Spanish Catholicism in Flux (28th). See F 2354.
1454 Radio Netherlands: Documentary. The Titantic: Encore (14th). See A 2354.

Saturdays

1400 Czech Rep, Radio Prague: News. See S 0000.
1400 Ecuador, HCJB Quito (am): Rock Solid!. A new rock music program.
1405 Czech Rep, Radio Prague: Live in Prague. See S 0005.
1430 Guam, AWR/KSDA: Music. See M 1430.
1445 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.

Hauser's Highlights
INDIA: All India Radio

GOS in English until March 2

1000-1100	11585, 13700, 15050, 17387, 17840
1330-1500	11620, 13750
1530-1545	7140, 7410, 9700, 9910, 11740 [home service news]
1745-1945	7410, 9650, 9950, 11620, 11935, 13770, 13780, 15075
2045-2230	7150, 7410, 9910, 9950, 11620, 11715
2245-2445	7170, 9705, 9950, 11620

(AIR website via Alan Roe, UK)

Frequencies

1500-1600	Australia, Radio	5995pa	6060pa	6080pa	9580pa
		9615as	11660as	11800pa	12080pa
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600 vl	Canada, CBC N Quebec Svc	9625do			
1500-1600	Canada, CFCX Montreal	6005do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, R Canada Intl	9640am	11855am		
1500-1600	China, China Radio Intl	7405na	9535as	9785as	
1500-1600	Costa Rica,RF Peace Intl	7385am	15050am		
1500-1600	Ecuador, HCJB	12005am	15115am	21455am	
1500-1600 as	Eqt Guinea, R East Africa	15186af			
1500-1600	Guam, TWR/KTWR	11580as			
1500-1600 t	Ireland,W Coast R Ireland	6015eu			
1500-1530	Israel, Kol Israel	9390na	11605na		
1500-1600	Italy, Adv World Radio	7230eu			
1500-1600 vl	Italy, IRRS	3985va			
1500-1600	Japan, R Japan/NHK World	7200af	7225af	7240af	9535na
		15355af			
1500-1600	Jordan, Radio	11690eu			
1500-1600	Malaysia, Radio	7295do			
1500-1600 vl	Malaysia, RTM Kuching	7160do			
1500-1600 vl	Malaysia,RTM KotaKinabalu	5980do			
1500-1515 s	Myanmar, Voice of	5990do			
1500-1525	Netherlands, Radio	9895as	13700as	15585as	
1500-1600 occsnal	New Zealand, R NZ Intl	6105pa			
1500-1550	North Korea, R Pyongyang	9325eu	9640eu	9975na	13785me
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1530	Romania, R Romania Intl	11740as	15335as		
1500-1600 vl/s	Russia, Voice of Assyria	7325do	9730do	9880do	
1500-1600	Russia,Voice of Russia WS	4740me	4940me	4975me	5925me
		7115af	7130me	7165me	9470af
		9585af	9635me	9840me	15205me

1500-1600	S Africa, Channel Africa	7155af	9685af		
1500-1600 mtwhfa	Seychelles, FEBA Radio	9810as			
1500-1545 s	Seychelles, FEBA Radio	11870as			
1500-1515 wh	Seychelles, FEBA Radio	11870as			
1500-1530 mt fa	Seychelles, FEBA Radio	11870as			
1500-1600	Singapore,R Corp of Sing	6155do			
1500-1600 mtwhf	Sri Lanka, Sri Lanka BC	9730as			
1500-1530	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1500-1600	United Kingdom, BBC WS	5975as	5990as	6190af	6195as
		9410va	9515na	9590am	9740am
		11750as	12095as	15220am	15400af
		15485af	15565va	15575as	17640va
		17830af	17840am	21470af	
1500-1530	United Kingdom, BBC WS	11860af	11940af	15420af	17880af
		21490af			
1500-1600	USA, KAIJ Dallas TX	13815am			
1500-1600	USA, KTBN Salt Lk City UT	7510am			
1500-1600	USA, Monitor Radio Intl	9355as			
1500-1600	USA, Voice of America	6110as	7125as	7215as	9575me
		9645as	9760as	15205as	15395as
1500-1600	USA, WEWN Birmingham AL	9455na	11875na	15665eu	
1500-1600	USA, WGTG McCaysville GA	9400am			
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na			
1500-1600	USA, WRNO New Orleans LA	15420am			
1500-1600 as	USA, WVHA Greenbush ME	15745na			
1500-1600	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1500-1600	USA, WYFR Okeechobee FL	11830na	17760na		
1500-1600	Zambia, Christian Voice	6065af			
1530-1555	Austria, R Austria Intl	6155as	9495af	9655me	13730af
1530-1545	India, All India Radio	3945do	6185do	7140do	7410do
		9530do	9565do	9685do	9700do
		9910do	11740do		
1530-1600	Iran, VOIRI	7290as	9635as		
1530-1600	Mongolia, R Ulan Bator	9745eu	12025au		
1530-1600	Netherlands, Radio	9895as	12090as		
1530-1600 mtwhf	United Kingdom, BBC WS	7180as			
1530-1600	United Kingdom, BBC WS	17705va			
1550-1600 a/vl	Vatican State, Vatican R	9940as	11640as		

Selected Programs

Sundays

1500 Ecuador, HCJB Quito (am): Encounter. Expository biblical preaching by Stephen Olford.
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. Ten minutes of international news from the land of the wind-up radio.
1509 S Africa, Channel Africa: Religions of the World. An examination of religious beliefs throughout Africa and beyond.
1510 Japan, NHK/Radio: Hello from Tokyo. See S 1110.
1525 S Africa, Channel Africa: Africa and All That Jazz. News from the jazz music scene and selections of jazz recordings.
1530 Ecuador, HCJB Quito (am): Let My People Think. Addressing questions of today's thinking Christians.
1555 Japan, NHK/Radio: News Summary. See S 1155.

Mondays

1500 Ecuador, HCJB Quito (am): Back to the Bible. A mix of music and daily Bible study. (www.gospelcom.net/bttb/)
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. See S 1500.
1510 S Africa, Channel Africa: Yours and Mine. A light mixture of popular music, listener music requests and the mailbag for a South African weekday afternoon.
1511 Japan, NHK/Radio: Asian Top News. The most important stories from other Asian media organizations are summarized in a new 10-minute format.
1521 Japan, NHK/Radio: Profile. An in-depth interview with a Japanese personality.
1530 Ecuador, HCJB Quito (am): Thru the Bible. J. Vernon McGee presents a book-by-book study of the Bible.
1551 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
1555 Japan, NHK/Radio: News. See S 1100.

Tuesdays

1500 Ecuador, HCJB Quito (am): Back to the Bible. See M 1500.
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. See S 1500.
1511 Japan, NHK/Radio: Asian Top News. See M 1511.
1521 Japan, NHK/Radio: Enjoy Japanese. Learn and practice the Japanese language.
1530 Ecuador, HCJB Quito (am): Thru the Bible. See M 1530.
1551 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
1555 Japan, NHK/Radio: News Summary. See S 1155.

Wednesdays

1500 Ecuador, HCJB Quito (am): Back to the Bible. See M 1500.
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. See S 1500.
1511 Japan, NHK/Radio: Asian Top News. See M 1511.
1512 S Africa, Channel Africa: Face to Face. Interviews with women who shape Africa's future.
1521 Japan, NHK/Radio: Town and Around. Take a half-hour guided tour of the cities and towns of Japan.
1530 Ecuador, HCJB Quito (am): Thru the Bible. See M 1530.
1535 S Africa, Channel Africa: Music. See S 1652.
1551 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
1554 Radio Netherlands: Documentary. Childless by Choice (19th). See F 1454.
1554 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (5th). See W 1254.
1554 Radio Netherlands: Documentary. Spanish Catholicism in Flux (26th). See F 2354.
1554 Radio Netherlands: Documentary. The Titantic: Encore (12th). See A 2354.
1555 Japan, NHK/Radio: News Summary. See S 1155.

Thursdays

1500 Ecuador, HCJB Quito (am): Back to the Bible. See M 1500.
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. See S 1500.
1511 Japan, NHK/Radio: Asian Top News. See M 1511.
1512 S Africa, Channel Africa: South Africa This Week. A wrapup of the week's South African news.
1521 Japan, NHK/Radio: Enjoy Japanese. See T 1521.
1530 Ecuador, HCJB Quito (am): Thru the Bible. See M 1530.
1532 S Africa, Channel Africa: Yours and Mine. See M 1510.
1551 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
1555 Japan, NHK/Radio: News Summary. See S 1155.

Fridays

1500 Ecuador, HCJB Quito (am): Back to the Bible. See M 1500.
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. See S 1500.
1511 S Africa, Channel Africa: Network Africa. News about Africa, sporting news, financial reports and music.
1515 Japan, NHK/Radio: Asian Top News. See M 1511.
1521 Japan, NHK/Radio: Music and Book Beat. What people in Japan are listening to and reading.
1530 Ecuador, HCJB Quito (am): Thru the Bible. See M 1530.
1538 S Africa, Channel Africa: Music. See S 1652.
1551 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
1555 Japan, NHK/Radio: News Summary. See S 1155.

Saturdays

1500 Ecuador, HCJB Quito (am): Words of Hope. David Bass provides the message.
1500 Japan, NHK/Radio: News. See S 1100.
1500 S Africa, Channel Africa: News. See S 1500.
1510 Japan, NHK/Radio: Asia Weekly. A magazine of news from other Asian broadcasters, entertainment update and music.
1511 S Africa, Channel Africa: Yours for the Asking. A light mixture of popular music, listener music requests and the mailbag for a South African Saturday afternoon.
1514 Japan, NHK/Radio: Asia Kaleidoscope. Life in Japan and the region.
1527 Japan, NHK/Radio: Echoes of Asia. Focus on regional music and musical instruments.
1530 Ecuador, HCJB Quito (am): Family Foundations. Interviews and discussions about issues affecting today's family.
1538 Japan, NHK/Radio: Who's Who in Asia. Lifestyle in the Asia-Pacific region.
1550 Japan, NHK/Radio: Asian News Summary of the Week. News headlines from other Asian news services.
1555 Japan, NHK/Radio: News Summary. See S 1155.

Frequencies

1600-1700	Australia, Radio	5995pa	6060pa	6080pa	6090pa
		9580pa	9615pa	9860pa	11660pa
		11800pa	12080pa		
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFCX Montreal	6005do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1700 s	Canada, R Canada Intl	9640am	11855am		
1600-1700	China, China Radio Intl	15110af	15130af		
1600-1700	Costa Rica,RF Peace Intl	7385am	15050am		
1600-1630	Ethiopia, Radio	7165af			
1600-1700	France, Radio France Intl	6175eu	9485af	11615me	11700af
		12015af	15530af		
1600-1650	Germany, Deutsche Welle	6150as	6170as	7225as	7305as
		9585as			
1600-1700	Germany, Deutsche Welle	7195af	9735af	11810af	13610af
		15145af			
1600-1700	Guam, AWR/KSDA	7395as			
1600-1630	Iran, VOIRI	7290as	9635as		
1600-1700 vl	Italy, IRRS	3985va			
1600-1700	Jordan, Radio	11690eu			
1600-1700	Malaysia, Radio	7295do			
1600-1630	Mexico, Radio Mexico Intl	9705na			
1600-1625	Netherlands, Radio	9895as	12090as		
1600-1650 occsnal	New Zealand, R NZ Intl	6105am			
1600-1630 s	Norway, Radio Norway Intl	9590af	9985eu	11840na	
1600-1630	Pakistan, Radio	9425as	9515as	11570af	11955af
		13590af	15555af		
1600-1700	Russia,Voice of Russia WS	4740me	4940me	4975me	6175me
		7115af	7175af	7210af	7275af
		7330eu	9470me	9505me	9550af
		9585af	9635af	11865af	13670af
		15205me			
1600-1700 sm	Russia,Voice of Russia WS	6005me			
1600-1700	S Africa, Channel Africa	7155af	9685af	15240af	
1600-1700	Singapore,R Corp of Sing	6155do			
1600-1700	Slovakia, Adv World Radio	13590as			
1600-1700	South Korea, R Korea Intl	5975eu	9515af	9870af	
1600-1700	Swaziland, Trans World R	9500af			
1600-1640	UAE, Radio Dubai	11795me	13675eu	15395me	17825me
1600-1700	United Kingdom, BBC WS	3915as	6190af	7135va	9410va
		9515am	11940af	12095as	15400af
		15485eu	17830af	17840am	21470af
		21660af			
1600-1615 mtwhf	United Kingdom, BBC WS	7180as			
1600-1615	United Kingdom, BBC WS	5990as	6195as	9510as	9740as
		15420af	15575va	17705af	
1600-1615 as	United Kingdom, BBC WS	11860af			
1600-1700	USA, KAIJ Dallas TX	13815am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	6120as			
1600-1700	USA, Monitor Radio Intl	9355eu	9385af	18930af	
1600-1700	USA, Voice of America	6035af	6110as	7125as	7215as
		9575as	9645as	9760as	11920af
		12040af	13600af	13710af	15205af
		15225af	15395as	15410af	15445af
		17895af			
1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15665eu	
1600-1700	USA, WGTG McCaysville GA	9400am			
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WJCR Upton KY	7490na			
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1700 as	USA, WVHA Greenbush ME	15745va			
1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15695eu	17555eu
		17760eu	21525af		
1600-1630 a	Vatican State, Vatican R	9940as	11640as		
1600-1620 smtwhf	Vatican State, Vatican R	9940as	11640as		
1600-1630	Vietnam, Voice of	7400eu	9840eu		
1600-1700	Zambia, Christian Voice	3330af			
1600-1610 mtwhfa	Zambia, ZNBC Radio 2	6165do			
1615-1700	United Kingdom, BBC WS	9510as	11860af		
1615-1630	Vatican State, Vatican R	5880eu	7250eu	9645eu	11810eu
1620-1630 mtwhf	Estonia, Radio	5925eu			
1630-1655	Austria, R Austria Intl	11780as			
1630-1700	Canada, R Canada Intl	7150as	9550as		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Georgia, Radio	6230me			
1630-1700	Slovakia, Adv World Radio	15620af			
1645-1700 irreg	Afghanistan, Radio	7200as			
1650-1700	Eqt Guinea, Radio Africa	15186af			
1650-1700 mtwhf	New Zealand, R NZ Intl	6070pa			

Selected Programs

Sundays

1600 R France Intl: News, World, French news, sports.
1600 S Africa, Channel Africa: News. See S 1500.
1610 S Africa, Channel Africa: Short Story. A twenty-minute reading of a short story written by a South African author.
1619 R France Intl: Everywoman (biweekly). A program for and about women.
1619 R France Intl: Health Concerns (biweekly). Reports on medicine, fitness, and ecology.
1622 R France Intl: Paris Promenade. Spotlight on a city bistro or restaurant.
1626 R France Intl: African Analysis (biweekly). An in-depth analysis of African current affairs.
1626 R France Intl: Echoes from Africa (biweekly). An African music program.
1630 Channel Africa: Contact Club Africa. A weekly opportunity for Africans to become pen pals with other Africans.
1631 R France Intl: News Headlines. A summary of today's news.
1632 R France Intl: Club 9516. Mailbag program.
1640 S Africa, Channel Africa: Health Forum. An examination of current health issues in Africa.
1652 Channel Africa: Music. The popular music of South Africa.

Mondays

1600 R France Intl: News. See S 1600.
1600 S Africa, Channel Africa: News. See S 1500.
1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1606 USA: Monitor Radio International. See M 1306.
1610 S Africa, Channel Africa: News Watch. A magazine program of music and African news with segments on sports, business and finanace, and technology.
1631 R France Intl: RFI Europe. European press review focuses on current affairs in other countries of the region.
1638 R France Intl: News Headlines. See S 1631.
1640 R France Intl: Sports. A summary of the seasonal matches from around the continent.
1647 R France Intl: Arts in France. Profile on the work of a French artist or a cultural activity such as music.
1649 USA, Monitor Radio Intl: Letterbox. See M 1349.
1652 Monitor Radio Intl: Article from the CSM. See M 1352.

Tuesdays

1600 R France Intl: News. See S 1600.
1600 S Africa, Channel Africa: News. See S 1500.
1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1606 USA: Monitor Radio International. See M 1306.
1610 S Africa, Channel Africa: News Watch. See M 1610.
1633 R France Intl: RFI Europe. See M 1631.
1640 R France Intl: News Headlines. See S 1631.
1642 R France Intl: Books. New books, publishing trends, and authors.
1647 R France Intl: Drumbeat. African feature.
1649 USA, Monitor Radio Intl: Letterbox. See M 1349.
1652 Monitor Radio Intl: Article from the CSM. See M 1352.

Wednesdays

1600 R France Intl: News. See S 1600.
1600 S Africa, Channel Africa: News. See S 1500.
1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1606 USA: Monitor Radio International. See M 1306.
1610 S Africa, Channel Africa: News Watch. See M 1610.
1631 R France Intl: RFI Europe. See M 1631.
1638 R France Intl: News Headlines. See S 1631.
1641 R France Intl: The Bottom Line. Focus on financial matters.
1646 R France Intl: Land of France. A feature on life and times in France.
1649 USA, Monitor Radio Intl: Letterbox. See M 1349.
1652 Monitor Radio Intl: Article from the CSM. See M 1352.

Thursdays

1600 R France Intl: News. See S 1600.
1600 S Africa, Channel Africa: News. See S 1500.
1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1606 USA: Monitor Radio International. See M 1306.
1610 S Africa, Channel Africa: News Watch. See M 1610.
1630 R France Intl: Sports. See M 1640.
1632 R France Intl: RFI Europe. See M 1631.
1639 R France Intl: News Headlines. See S 1631.
1641 R France Intl: North/South (biweekly). Focus on a public activity in France.
1641 R France Intl: Planet Earth (biweekly). An interview with an expert on ecological matters.
1646 R France Intl: Science Probe. Developments in the world of science, technology, and health.
1649 USA, Monitor Radio Intl: Letterbox. See M 1349.
1652 Monitor Radio Intl: Article from the CSM. See M 1352.

Fridays

1600 R France Intl: News. See S 1600.
1600 S Africa, Channel Africa: News. See S 1500.
1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1606 USA: Monitor Radio International. See M 1306.
1610 S Africa, Channel Africa: News Watch. See M 1610.
1631 R France Intl: RFI Europe. See M 1631.
1638 R France Intl: News Headlines. See S 1631.
1641 R France Intl: Film Reel. Interview re film making.
1646 R France Intl: Made in France. Review of something French.
1649 USA, Monitor Radio Intl: Letterbox. See M 1349.
1652 Monitor Radio Intl: Article from the CSM. See M 1352.

Saturdays

1600 R France Intl: News. See S 1600.
1600 S Africa, Channel Africa: News. See S 1500.
1600 USA, Monitor Radio Intl: Monitor Radio News. See M 1300.
1606 USA, Monitor Radio Intl: Christian Science Sentinel Radio Edition. See S 1329.
1612 S Africa, Channel Africa: Today's Dream. A musical magazine for Africa's youth.
1614 R France Intl: Focus on France. French news item.
1631 R France Intl: Spotlight on Africa. Correspondent reports and interviews on African affairs.
1642 Channel Africa: Cultural File. A visit to a gallery, etc.
1645 R France Intl: French Lesson. Learn French by radio.

FREQUENCIES

1700-1800	Australia, Radio	6060pa	6080pa	6090pa	9580pa
		9615as	9860pa	11660pa	11880pa
		12080pa			
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800 vl	Canada, CBC N Quebec Svc	9625do			
1700-1800	Canada, CFCX Montreal	6005do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	5220af	7150af	7405af	
1700-1730	China, China Radio Intl	6965af	7335af		
1700-1800 as	Costa Rica, Adv World R	13750am			
1700-1800	Costa Rica,RF Peace Intl	15050am			
1700-1727	Czech Rep, Radio Prague	5930eu	9430af		
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Eqt Guinea, Radio Africa	15186af			
1700-1730	France, Radio France Intl	9485af	11615af	12015me	
1700-1800 vl	Italy, IRRS	3985va			
1700-1800	Japan, R Japan/NHK World	6035na	7200na	7225na	9535na
		11880as	15205me		
1700-1730	Jordan, Radio	11690eu			
1700-1752 mtwhf	New Zealand, R NZ Intl	6070pa			
1700-1750	North Korea, R Pyongyang	9325eu	9640af	9975af	13785me
1700-1800 vl	Pakistan, Radio	5825eu	11570eu		
1700-1800	Russia,Voice of Russia WS	4740me	5940eu	6110eu	6130eu
		7115af	7130me	7175af	7180eu
		7210me	7255me	7275me	7305af
		7325af	7330eu	7440eu	9505af
		9550af	9585af	9890eu	13670af
1700-1755	S Africa, Channel Africa	7155af	9685af		
1700-1730	Switzerland, Swiss R Intl	5850af	9885af	9905af	
1700-1800	Switzerland, Swiss R Intl	7410eu			
1700-1800	United Kingdom, BBC WS	3955eu	5975as	6090va	6180va
		6190af	6195eu	9410va	9510as
		9740as	11750as	11940af	12095eu
		15400af	15420af	15485eu	15575af
		17830af	17840af		
1700-1745	United Kingdom, BBC WS	3915as	7135as	9630af	11860af
1700-1800	USA, KAIJ Dallas TX	13815am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KVOH Los Angeles CA	17775na			
1700-1800	USA, KWHR Naalehu HI	6120as			
1700-1800	USA, Monitor Radio Intl	9355eu	9385af	18930af	
1700-1800	USA, Voice of America	6035af	6040eu	6110as	7125as
		7215as	9645as	9760me	11920eu
		12040af	13600eu	13710af	15205me
		15395as	15445af	15580af	17895eu
1700-1800 mtwhf	USA, Voice of America	5990as	6045as	9525as	9670as
		9770as	12005as	19795as	
1700-1800	USA, WEWN Birmingham AL	11875na	13615na	15665eu	
1700-1800	USA, WGTG McCaysville GA	9400am			
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WJCR Upton KY	7490na			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1800	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1700-1800	USA, WYFR Okeechobee FL	15695eu	17555eu		
1700-1800	Zambia, Christian Voice	3330af			
1700-1800 a	Zambia, ZNBC Radio 2	6165do			
1700-1800 vl	Zimbabwe, Zimbabwe BC	4828do			
1715-1730	Albania, R Tirana Intl	6185eu	7155eu		
1730-1800	Guam, AWR/KSDA	9370as			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1730-1800	Romania, R Romania Intl	11740af	11940af	15340af	
1730-1800	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1730-1800	Swaziland, Trans World R	3200af			
1730-1800	Vatican State, Vatican R	9660af	11625af	15570af	
1745-1800	Bangladesh,Bangla Betar	7185as	9548eu	15520do	
1745-1800	India, All India Radio	7410eu	9650eu	9950af	11620af
		11935af	13770as	13780do	15075me
1753-1800 mtwhf	New Zealand, R NZ Intl	9810pa			
1800-1900	Australia, Radio	9580pa	9860pa	11880pa	12080pa
1800-1830	Australia, Radio	6060pa	6080as		
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8K Katherine	2485do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bangladesh,Bangla Betar	7185eu	9548as	15520do	
1800-1900	Brazil, Radio Bras	15265eu			
1800-1900	Canada, CFCX Montreal	6005do			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica,RF Peace Intl	15050am			
1800-1827	Czech Rep, Radio Prague	5835eu	9430af		
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Eqt Guinea, Radio Africa	15186af			
1800-1900	India, All India Radio	7410eu	9650eu	9950af	11620af
		11935me	13770as	13780as	15075as
1800-1900 t	Ireland,W Coast R Ireland	11665af			
1800-1900	Kuwait, Radio	11990na			
1800-1900 s	Morocco, RTVM Marocaine	17815af			
1800-1825	Netherlands, Radio	6020af	9605af	11655af	
1800-1900 mtwhf	New Zealand, R NZ Intl	9810pa			
1800-1900 vl	Pakistan, Radio	11570eu			
1800-1900 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1800-1855	Poland, Polish R Warsaw	6000eu	6095eu	7270eu	7285eu
1800-1900	Russia,Voice of Russia WS	6130eu	7175af	7180eu	7305af
		7325af	7440eu	9505af	9890eu
		13670af			
1800-1900	Sudan, Radio Omdurman	9200af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1830	Swaziland, Trans World R	9500af			
1800-1900	United Kingdom, BBC WS	3255af	3955eu	6005eu	6180eu
		6190af	6195eu	9410va	12095eu
		15400af	15420af	15485va	17830af
1800-1830	United Kingdom, BBC WS	5975as	6090va	9510as	
1800-1900	USA, KAIJ Dallas TX	13815am			
1800-1900	USA, KJES Mesquite NM	15385na			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	13625au			
1800-1900	USA, Monitor Radio Intl	9355eu	9385af	11550eu	18930af
1800-1900	USA, Voice of America	6040va	9760me	11920af	12040af
		13710af	15410af	15580af	
1800-1900	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
1800-1900	USA, WGTG McCaysville GA	9400am			
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1800-1900	USA, WJCR Upton KY	7490na			
1800-1900	USA, WMLK Bethel PA	9465eu			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1900 mtwhf	USA, WVHA Greenbush ME	11580af			
1800-1900	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1800-1900	USA, WYFR Okeechobee FL	15695eu	17555eu		
1800-1845	USA, WYFR Okeechobee FL	15695eu			
1800-1830	Vietnam, Voice of	7400eu	9840eu		
1800-1900	Yemen, Yemeni Rep Radio	9780do			
1800-1900	Zambia, Christian Voice	3330af			
1800-1810	Zambia, ZNBC Radio 1	7220do			
1800-1857	Zambia, ZNBC Radio 2	6165do			
1800-1900 vl	Zimbabwe, Zimbabwe BC	4828do			
1830-1900	Australia, Radio	7240pa	7330as		
1830-1900	Netherlands, Radio	6020af	9605af	11655af	15315af
		17605af			
1830-1900	South Korea, R Korea Intl	3970eu			
1830-1900	United Kingdom, BBC WS	9630af			
1833-1900	Cote D' Ivoire, RDTV	11920do			
1840-1850	Greece, Voice of	11645af	15150af		
1845-1900 mtwhf	Armenia, Voice of	4810me	4990eu	7480me	
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900 s	New Zealand, R NZ Intl	9810pa			
1858-1900 s	Germany, R Alpha & Omega	6110eu			

Hello, Writers...

Do you have a topic you've always "thought about" writing up for Monitoring Times? Now is the time! Given our full-spectrum coverage, plus the interest in new technology on the one hand and nostalgia for the past on the other, there is no limit to appropriate subject matter to write about. Bone up on your research, warm up your pen, and you, too, can earn a little spending money!

Pitch your idea to the editor at mteditor@grove.net or call 704-837-9200 and ask for Rachel. Writer's Guidelines are available on the MT homepage at www.grove.net, or for an SASE.

FREQUENCIES

1900-2000 mtwhf	Argentina, RAE	15345eu			
1900-2000	Australia, Radio	6080pa	7240pa	7330as	9580pa
		9860pa	11880pa	12080pa	
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-1925 mtwhfs	Belgium, R Vlaanderen Int	5910eu	9925af		
1900-1920	Brazil, Radio Bras	15265eu			
1900-2000	Canada, CFCX Montreal	6005do			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af		
1900-2000	Costa Rica, Adv World R	13750am	15460am		
1900-2000	Costa Rica,RF Peace Intl	15050am			
1900-1930	Cote D' Ivoire, RDTV	11920do			
1900-2000	Ecuador, HCJB	11960eu	21455am		
1900-2000	Eqt Guinea, Radio Africa	15186af			
1900-1950	Germany, Deutsche Welle	9640af	9765af	11785af	11810af
		13690af	15135af	15425af	
1900-2000 s	Germany, R Alpha & Omega	6110eu			
1900-1910	Greece, Voice of	9375eu			
1900-2000	Guatemala, Adv World R	5980am			
1900-1945	India, All India Radio	7410eu	9650eu	9950me	11620eu
		11935af	13770as	13780as	15075as
1900-2000 vl	Italy, IRRS	3985va			
1900-2000	Japan, R Japan/NHK World	6035as	7140pa	7200as	9535na
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-2000	Kuwait, Radio	11990eu			
1900-2000 smtwha	Malta, VO Mediterranean	7390va	7440va		
1900-2000	Netherlands, Radio	6020af	9605af	11655af	15315af
1900-1952 mtwhfa	New Zealand, R NZ Intl	9810pa			
1900-1958 a	New Zealand, R NZ Intl	9810pa			
1900-1930 s	Norway, Radio Norway Intl	5960eu	7485af	9590af	
1900-1930 vl	Philippines, R Pilipinas	11815me	11890me	15190me	
1900-2000	Romania, R Romania Intl	5955eu	7105af	7195eu	9690eu
1900-2000	Russia,Voice of Russia WS	4920eu	5940eu	6110eu	6130eu
		7180eu	7210af	7255af	7275af
		7305af	7325af	7440eu	9505af
		9585af	9890eu		
1900-2000	South Korea, R Korea Intl	5975eu	7275as		
1900-2000	Swaziland, Trans World R	3200af			
1900-2000	Thailand, Radio	7295eu	9655eu	11905eu	
1900-2000	United Kingdom, BBC WS	3255af	3955eu	6005af	6180eu
		6190af	6195va	9410af	9630af
		9740as	12095eu	15400af	15485va
		17830af			
1900-1915	United Kingdom, BBC WS	11835af			
1900-2000	USA, KAIJ Dallas TX	13815am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	13625au			
1900-2000	USA, Monitor Radio Intl	9355eu	9385af	11550eu	17510af
1900-2000	USA, Voice of America	4950af	6035af	7415af	9525pa
		9760me	11870pa	11920af	11975va
		12040af	13710af	15180pa	15410af
		15580af			
1900-2000	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
1900-2000	USA, WGTG McCaysville GA	9400am			
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WJCR Upton KY	7490na			
1900-2000	USA, WMLK Bethel PA	9465eu			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-2000 smtwhf	USA, WVHA Greenbush ME	9930af			
1900-2000	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1900-1945	USA, WYFR Okeechobee FL	17555eu			
1900-1930	Vietnam, Voice of	7400eu	9840eu		
1900-2000	Zambia, Christian Voice	3330af			
1900-2000 vl	Zimbabwe, Zimbabwe BC	4828do			
1903-2010	Croatia, Croatian Radio	5895eu	5920eu	7165eu	9830eu
		11635eu	11830eu	13830eu	
1930-2000	Albania, R Tirana Intl	6270eu	7270eu		
1930-1955	Austria, R Austria Intl	5945eu	6155eu	9495af	13730af
1930-2000	Georgia, Radio	6080eu			
1930-2000	Iran, VOIRI	7260af	9022eu		
1930-2000	Mongolia, R Ulan Bator	9745eu	12085eu		
1930-2000 vl	Papua New Guinea, NBC	4890do			
1930-2000	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1930-2000	South Korea, R Korea Intl	3970eu			
1930-2000	Sweden, Radio	6065eu	7240eu	9655af	
1930-2000	Turkey, Voice of	5970na	6000na		
1930-2000 a	Yugoslavia, Radio	6100eu	9720af		
1935-1955	Italy, RAI Intl	6030eu	7235eu		
1945-2000 t	Belarus, Radiosta Belarus	7105eu	7180eu	7210eu	9875eu
1950-2000	Vatican State, Vatican R	4005eu	5880eu	7250eu	
1953-2000 smtwhf	New Zealand, R NZ Intl	11735pa			
1959-2000 a	New Zealand, R NZ Intl	11735pa			

2000-2100	Angola, Radio Nacional	3355do	9535do		
2000-2100	Australia, Radio	6080pa	7240pa	7330as	9580pa
		9860pa	11880pa	12080pa	
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bulgaria, Radio	7335eu	9700eu		
2000-2100	Canada, CFCX Montreal	6005do			
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	5220eu	6950eu	9440af	9920eu
		11715af	15110af		
2000-2100	Costa Rica,RF Peace Intl	15050am			
2000-2027	Czech Rep, Radio Prague	5930eu	7345af		
2000-2100	Ecuador, HCJB	11960eu	21455am		
2000-2100	Eqt Guinea, Radio Africa	15186af			
2000-2030 m	Estonia, Radio	5925eu			
2000-2050	Germany, Deutsche Welle	5960eu	7285eu	9615eu	9670pa
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2100	Guatemala, Adv World R	5980am			
2000-2030	Hungary, Radio Budapest	3975eu	5970eu	9835eu	
2000-2100	Indonesia, Voice of	9525as			
2000-2030	Iran, VOIRI	7260af	9022eu		
2000-2025	Israel, Kol Israel	7465na	9365eu	9435na	15640af
2000-2100 vl	Italy, IRRS	3985va			
2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2000-2100	Kuwait, Radio	11990eu			
2000-2030 as	Latvia, Radio	5935eu			
2000-2030	Mexico, Radio Mexico Intl	9705na			
2000-2025	Netherlands, Radio	6020af	9605af	11655af	15315af
2000-2006 fa	New Zealand, R NZ Intl	9875pa			
2000-2100 mtwhf	New Zealand, R NZ Intl	11735pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2000-2050	North Korea, R Pyongyang	6575eu	9345as	9640af	9975as
2000-2100 vl	Papua New Guinea, NBC	4890do			
2000-2030 mtwhf	Portugal, R Portugal Intl	6130eu	9780eu	9815eu	15515af
2000-2100	Russia,Voice of Russia WS	4920eu	5940eu	6110eu	6130eu
		7175af	7180eu	7305af	7325af
		9585af	9890eu	13670af	
2000-2015	Sierra Leone, SLBS	3316do			
2000-2015 irreg	Somalia, Radio Mogadishu	6870af			
2000-2100 mtwhf	Spain, R Exterior Espana	6125eu	11775af		
2000-2045	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	9885af	9905af	11640af	13635af
2000-2020	Switzerland, Swiss R Intl	6165eu			
2000-2030	Turkey, Voice of	5970na	6000na		
2000-2015	Uganda, Radio	3340do			
2000-2100	United Kingdom, BBC WS	3255af	3955eu	6005af	6180eu
		6190af	6195eu	7150va	7325va
		9410af	9630af	9740as	11750am
		11835af	11955as	12095eu	15400af
		17830af			
2000-2100	USA, KAIJ Dallas TX	13815am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, KWHR Naalehu HI	11815as			
2000-2100	USA, Monitor Radio Intl	5835eu	7510eu	13840pa	
2000-2100	USA, Voice of America	6035af	7415af	9760me	11855af
		11975af	13710af	15205me	15410af
		15580af	17725af	17755af	
2000-2100	USA, WEWN Birmingham AL	7425na	13615na	17695eu	
2000-2100	USA, WGTG McCaysville GA	9400am			
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WJCR Upton KY	7490na			
2000-2100	USA, WMLK Bethel PA	9465eu			
2000-2100 s	USA, WRMI/R Miami Intl	9955am			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2100 mtwhfa	USA, WVHA Greenbush ME	9930va			
2000-2100	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2000-2100	USA, WYFR Okeechobee FL	5810eu	7355af	15566af	
2000-2045	USA, WYFR Okeechobee FL	21525af			
2000-2030	Vatican State, Vatican R	7365eu	9645eu		
2000-2030	Zambia, Christian Voice	3330af			
2000-2005	Zambia, ZNBC Radio 2	6165do			
2000-2100 vl	Zimbabwe, Zimbabwe BC	4828do			
2005-2100	Syria, Radio Damascus	12085na	13610eu		
2007-2100 fa	New Zealand, R NZ Intl	11735pa			
2025-2045	Italy, RAI Intl	7115af	9685af	11840af	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2100	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2030-2100	Slovakia, Adv World Radio	9455af			
2030-2100	Sweden, Radio	6065eu			
2030-2045	Thailand, Radio	9655eu	11805as	11905eu	
2030-2100 as	USA, Voice of America	4950eu			
2030-2100	Uzbekistan, R Tashkent	4850eu	7105eu	9540eu	
2030-2100	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
		12020eu	15010eu		
2045-2100	India, All India Radio	7150eu	7410eu	9910au	9950eu
		11620eu	11715pa		

FREQUENCIES

2100-2200	Australia, Radio	7240pa	9660pa	9850pa	9860as
		11640as	11695pa	11855as	11880pa
		12080pa	13605pa		
2100-2130	Australia, Radio	6080pa	11800pa		
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2200 vl	Australia, VL8K Katherine	5025do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2200 vl	Australia, VL8T Tent Crk	4910do			
2100-2200 vl	Cameroon, Radio Garoua	5010do			
2100-2200 vl	Canada, CBC N Quebec Svc	9625do			
2100-2200	Canada, CFCX Montreal	6005do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, R Canada Intl	5925eu	5995eu	7235eu	9805af
		11945af	13690af	15150af	
2100-2200	China, China Radio Intl	5220eu	6950eu	9920af	
2100-2130	China, China Radio Intl	11715af	15110af		
2100-2200	Costa Rica,RF Peace Intl	15050am			
2100-2200	Cuba, Radio Havana	13715eu	13725eu		
2100-2200	Ecuador, HCJB	11960eu	21455am		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2150	Germany, Deutsche Welle	9615af	9670as	9765as	11785pa
		11865af	15275af		
2100-2200	India, All India Radio	7150eu	7410eu	9910eu	9950eu
		11620au	11715au		
2100-2200 vl	Italy, IRRS	3955va			
2100-2200	Japan, R Japan/NHK World	6035as	9560as	9825as	11850pa
2100-2110	Japan, R Japan/NHK World	9860as	11685as		
2100-2107 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Voice of Hope	9960va			
2100-2135 smtwh	New Zealand, R NZ Intl	11735pa			
2100-2200 fa	New Zealand, R NZ Intl	11735pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2100-2200 vl	Papua New Guinea, NBC	4890do			
2100-2125	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2100-2200	Romania, R Romania Intl	5955eu	5990eu	7105eu	7195eu
2100-2200	Russia,Voice of Russia WS	5940eu	6110eu	7170eu	7180eu
		7320eu	7440eu	9890eu	
2100-2200	Slovakia, Adv World Radio	6055eu			
2100-2200	South Korea, R Korea Intl	6480eu	15575eu		
2100-2110	Uganda, Radio	3340do			
2100-2200	United Kingdom, BBC WS	3255af	3915as	3955eu	5965as
		5975am	6005af	6120as	6180eu
		6190af	6195va	7150va	7325eu
		9410va	9740as	11680va	11750sa
		11835af	11955as	12095va	
2100-2130	United Kingdom, BBC WS	9630af			
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200	USA, KWHR Naalehu HI	11815as			
2100-2200	USA, Monitor Radio Intl	5835eu	7510eu	13840au	
2100-2200	USA, Voice of America	6035af	6070me	7415af	9595me
		9760me	11975af	13710eu	15205me
		15410eu	15580eu	17725eu	
2100-2200	USA, WEWN Birmingham AL	7425na	13615na	17695eu	
2100-2200	USA, WGTG McCaysville GA	9400am			
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WJCR Upton KY	7490na			
2100-2200	USA, WMLK Bethel PA	9465eu			
2100-2200 a	USA, WRMI/R Miami Intl	9955am			
2100-2130 s	USA, WRMI/R Miami Intl	9955am			
2100-2200 mtwhfa	USA, WVHA Greenbush ME	9930va			
2100-2200	USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580eu	15565eu	
2100-2105	Zambia, ZNBC Radio 2	6165do			
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do			
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130	United Kingdom, BBC WS	11680am	15390am	17715am	
2130-2200	Armenia, Voice of	7480eu	9965eu	11615eu	
2130-2200	Australia, Radio	13755pa	17795pa	17860pa	
2130-2200	Finland, YLE/R Finland	6135eu			
2130-2200	Guam, AWR/KSDA	15310as			
2130-2200	Iran, VOIRI	6175au			
2130-2135 mtwhf	Latvia, Radio	5935eu			
2130-2200 as	Sweden, Radio	6065eu	7230af		
2130-2200	Uzbekistan, R Tashkent	4850eu	7105eu	9540eu	
2136-2200 smtwh	New Zealand, R NZ Intl	15115pa			
2145-2200 a	Greece, Voice of	9425au			

2200-2300	Australia, Radio	11695pa	11855as	12080pa	13755pa
		15365pa	17795pa	17860pa	
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2225	Belgium, R Vlaanderen Int	5910eu			
2200-2300	Bulgaria, Radio	7390eu	9700eu		
2200-2300	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFCX Montreal	6005do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2230	Canada, R Canada Intl	5995eu	7235eu	9805af	11705eu
		11945af	13690eu	15150eu	
2200-2300	China, China Radio Intl	7110eu	7175eu		
2200-2230	China, China Radio Intl	3985eu			
2200-2300	Costa Rica,RF Peace Intl	7385am	15050am		
2200-2300	Cuba, Radio Havana	6180na			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eqt Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2230	Hungary, Radio Budapest	3975eu	5970eu	7250eu	9835eu
2200-2230	India, All India Radio	7150eu	7410eu	9910eu	9950eu
		11620au	11715au		
2200-2230	Iran, VOIRI	6175au			
2200-2300 vl	Italy, IRRS	3955va			
2200-2225	Italy, RAI Intl	6150as	9565as	11815pa	
2200-2300	Lebanon, Voice of Hope	9960va			
2200-2300	Malaysia, Radio	7295do			
2200-2225 mtwhf	Moldova, R Moldova Intl	7520eu			
2200-2300 smtwh	New Zealand, R NZ Intl	15115pa			
2200-2215	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2200-2208 vl	Papua New Guinea, NBC	4890do			
2200-2300	Russia,Voice of Russia WS	5940eu	6110eu	7180eu	7205eu
		7320eu	7360eu	7400eu	9890eu
2200-2215	Sierra Leone, SLBS	3316do			
2200-2300	Slovakia, Adv World Radio	6055af			
2200-2300 as	Spain, R Exterior Espana	6125eu	11775af		
2200-2205	Syria, Radio Damascus	12085na	13610eu		
2200-2300	Taiwan, VO Free China	5810eu	9985eu		
2200-2300	Ukraine, R Ukraine Intl	5905eu	6010eu	6020eu	6080eu
		7115eu	7160eu	7205eu	7290eu
		7380eu			
2200-2300	United Kingdom, BBC WS	3955eu	5905as	5975am	6175am
		6180va	6195as	7110as	7150as
		7325va	9410va	9590am	9660as
		9915am	11750am	11835af	11955as
		12080as			
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, Monitor Radio Intl	7510eu	13770sa	13840as	
2200-2300	USA, Voice of America	7215as	9770as	9890as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2200-2230 mtwhf	USA, Voice of America	6035af	7415af	11975af	12080af
		13710af			
2200-2300	USA, WEWN Birmingham AL	7395na	11820eu	13615na	
2200-2300	USA, WGTG McCaysville GA	9400am			
2200-2300	USA, WHRI Noblesville IN	9495am			
2200-2300	USA, WJCR Upton KY	7490na			
2200-2300 smtwh	USA, WMLK Bethel PA	9465eu			
2200-2300 a	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2300 smtwhf	USA, WVHA Greenbush ME	5850af			
2200-2300	USA, WWCR Nashville TN	5070am	7435am	9475am	13845am
2200-2245	USA, WYFR Okeechobee FL	11580af	15565af	21525eu	
2200-2230	Yugoslavia, Radio	6100eu	6185eu		
2200-2210	Zambia, ZNBC Radio 2	6165do			
2207-2300 fa	New Zealand, R NZ Intl	15115pa			
2210-2300 vl	Papua New Guinea, NBC	9675do			
2230-2255	Austria, R Austria Intl	5945eu	6155eu	9495af	9880eu
2230-2257	Czech Rep, Radio Prague	5930na	7345na		
2230-2300	Sweden, Radio	6065eu	7325af		
2230-2300 mtwhf	USA, WRMI/R Miami Intl	9955am			
2240-2250	Greece, Voice of	9425au			
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	7170as	9705as	9950as	11620as
2245-2300	Vatican State, Vatican R	6065as	7305as	9600as	11830au

2300 UTC SHORTWAVE GUIDE 6:00 PM EST 3:00 PM PST

Frequencies

2300-0000	Australia, Radio	9660pa	11695as	11855as	13755as
		15365pa	17795pa	17860pa	
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-0000	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFCX Montreal	6005do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-2330	Canada, R Canada Intl	5960am	6040am	9535am	9755am
		11940am			
2300-0000	Costa Rica, Adv World R	5030am	6150am	7375am	9725am
		13750am	15460am		
2300-0000	Costa Rica,RF Peace Intl	7385am	15050am		
2300-0000	Egypt, Radio Cairo	9900na			
2300-2350	Germany, Deutsche Welle	6000as	6160as	7235as	
2300-0000	Guam, AWR/KSDA	11775as			
2300-0000	Guatemala, Adv World R	11775am			
2300-0000	India, All India Radio	7170as	9705as	9950as	11620as
2300-0000	Japan, R Japan/NHK World	6180eu	9560as	9825eu	11850pa
2300-0000	Lebanon, Voice of Hope	9960va			
2300-0000	Malaysia, Radio	7295do			
2300-2325 mtwhf	Moldova, R Moldova Intl	7520na			
2300-0000 as	New Zealand, R NZ Intl	15115pa			
2300-2315	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2300-2350	North Korea, R Pyongyang	11700na	13650na		
2300-2330 s	Norway, Radio Norway Intl	5905sa	7275as	7465na	
2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-0000	Romania, R Romania Intl	7175na	9510na	9570na	11940na
2300-0000	Russia,Voice of Russia WS	5940na	7105na	7125na	7170na
		7180na	7330na		
2300-0000	Turkey, Voice of	6135na	7280na	9650na	9655na
2300-0000	United Kingdom, BBC WS	5965as	5975am	6175am	6195am
		7110as	7180as	9580as	9590na
		9915am	11750sa	11945as	11955as
2300-2330 a	United Kingdom, BBC WS	11835af			
2300-2345	United Kingdom, BBC WS	3915va			
2300-0000	USA, KAIJ Dallas TX	13815am			
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	17510as			
2300-0000	USA, Monitor Radio Intl	7510af	13770sa		
2300-0000	USA, Voice of America	7215as	9770as	9890as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2300-0000	USA, WEWN Birmingham AL	6890na	13615na		
2300-0000	USA, WGTG McCaysville GA	5085am			
2300-0000	USA, WHRI Noblesville IN	5745am			
2300-0000	USA, WJCR Upton KY	7490na			
2300-0000 mtwhf	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WRNO New Orleans LA	7355am			
2300-0000 s	USA, WVHA Greenbush ME	5850eu			
2300-0000	USA, WWCR Nashville TN	3215am	5070am	7435am	13845am
2300-2315	Vatican State, Vatican R	7305as	9600as	11830na	
2303-2310	Croatia, Croatian Radio	5895eu	5920eu	7165eu	9830eu
		11635eu	11830eu	13830eu	
2310-2315	Kyrgyzstan, Kygyz Radio	4010eu	4050eu		
2330-0000 as	Canada, R Canada Intl	5960am	6010am	9535am	9755am
		11940am			
2330-0000	Canada, R Canada Intl	5960na	9755na		
2330-0000 vl	Ghana, Ghana Broadc Corp	4915af			
2330-2359	Netherlands, Radio	6020na	6165na		
2330-0000	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as	15010as		
2332-2359 irreg	Iraq, Radio Iraq Intl	11895eu			
2335-2345	Greece, Voice of	7450sa	9935sa	11640sa	
2355-0000	Japan, R Japan/NHK World	9860as	11685au		

Selected Programs

Sundays

2300 Guam, AWR/KSDA: Wavescan. A program for DXers and shortwave listeners produced at AWR's British studio.
2300 Japan, NHK/Radio: News. See S 1100.
2310 Japan, NHK/Radio: Let's Learn Japanese. A course in the Japanese language.
2320 Guam, AWR/KSDA: Pacific Island Journal. News and stories about the Pacific Islands.
2325 Japan, NHK/Radio: Media Roundup. Reception reports, DX/media news, and equipment reviews.
2330 Guam, AWR/KSDA: AWR Magazine. News and interviews on Asian topics.
2345 Guam, AWR/KSDA: Digging Up the Past. A look at archeological discoveries and research.
2350 Japan, NHK/Radio: Viewpoint. Opinions of a guest personality.
2355 Japan, NHK/Radio: Tokyo Pop-In. A sample of the Japanese music scene.

Mondays

2300 Guam, AWR/KSDA: Sounds of Inspiration. An adult Christian music program.
2300 Japan, NHK/Radio: News. See S 1100.
2311 Japan, NHK/Radio: Asian Top News. See M 1511.
2315 Guam, AWR/KSDA: Discovering the Bible. Recitation of scripture in story form.
2321 Japan, NHK/Radio: Profile. See M 1521.
2330 Guam, AWR/KSDA: The Bible in Living Sound. A dramatic look at the bible.
2345 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.
2351 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
2355 Japan, NHK/Radio: News. See S 1100.

Tuesdays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2300 Japan, NHK/Radio: News. See S 1100.
2311 Japan, NHK/Radio: Asian Top News. See M 1511.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2321 Japan, NHK/Radio: Enjoy Japanese. See T 1521.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2345 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.
2351 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
2355 Japan, NHK/Radio: News Summary. See S 1155.

Wednesdays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2300 Japan, NHK/Radio: News. See S 1100.
2311 Japan, NHK/Radio: Asian Top News. See M 1511.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2321 Japan, NHK/Radio: Town and Around. See W 1521.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2345 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.
2351 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
2355 Japan, NHK/Radio: News Summary. See S 1155.

Thursdays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2300 Japan, NHK/Radio: News. See S 1100.
2311 Japan, NHK/Radio: Asian Top News. See M 1511.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2321 Japan, NHK/Radio: Enjoy Japanese. See T 1521.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2345 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.
2351 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
2355 Japan, NHK/Radio: News Summary. See S 1155.

Fridays

2300 Guam, AWR/KSDA: Sounds of Inspiration. See M 2300.
2300 Japan, NHK/Radio: News. See S 1100.
2315 Guam, AWR/KSDA: Discovering the Bible. See M 2315.
2315 Japan, NHK/Radio: Asian Top News. See M 1511.
2321 Japan, NHK/Radio: Music and Book Beat. See F 1521.
2330 Guam, AWR/KSDA: The Bible in Living Sound. See M 2330.
2345 Guam, AWR/KSDA: Voice of Prophecy. See S 1445.
2351 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.
2354 Radio Netherlands: Documentary. Childless by Choice (21th). See F 1454.
2354 Radio Netherlands: Documentary. From the Wireless to the World Wide Web (7th). See W 1254.
2354 Radio Netherlands: Documentary. Spanish Catholicism in Flux (28th). Eric Beauchemin reports on how the Catholic Church's influence in Spain is waning.
2354 Radio Netherlands: Documentary. The Titantic: Encore (14th). See A 2354.
2355 Japan, NHK/Radio: News Summary. See S 1155.

Saturdays

2300 Guam, AWR/KSDA: Wavescan. See S 2300.
2300 Japan, NHK/Radio: News. See S 1100.
2310 Japan, NHK/Radio: Asia Weekly. See A 1510.
2311 Japan, NHK/Radio: Asian News Summary. This ten-minute wrap-up of regional events is heard as a segment of the program Asia Weekly.
2315 Guam, AWR/KSDA: Pacific Island Journal. See S 2320.
2321 Japan, NHK/Radio: Business Report. A summary of regional financial news heard as part of the program Asia Weekly.
2325 Japan, NHK/Radio: Entertaining in Asia. A segment of "Asian Report" which focuses on an aspect of entertainment in the region.
2330 Guam, AWR/KSDA: AWR Magazine. See S 2330.
2345 Guam, AWR/KSDA: Digging Up the Past. See S 2345.
2346 Japan, NHK/Radio: Asia Kaleidoscope. See A 1514.
2355 Japan, NHK/Radio: Tokyo Pop-In. See S 2355.

Hauser's Highlights

ALBANIA: R. Tirana

English: To Europe (310°)
1715-1730 6185, 7155
1930-2000 6270, 7270
To North America (305°)
0145-0200 6155, 7160
0230-0300 6140, 7160

Reception Against the Rules

By Jacques d'Avignon

One unusual propagation phenomena that occurs mostly in the lower latitudes is called the "Sporadic E" propagation. The "E" ionospheric layer is normally present only during the daytime at an altitude of about 100 to 150 kilometers (62 to 93 miles). The sporadic "E" type of propagation is caused by highly ionized patches or clouds moving about below the normal "E" layer. These clouds or patches will reflect frequencies as high as 50 MHz, or even 150 MHz along certain circuits. These clouds are believed to about 80 kilometers (49.6 miles) in diameter and travel around in the upper atmosphere.

This phenomena is predominantly a midday occurrence in the lower and equatorial latitudes and it normally disappears at dusk. In the equatorial latitudes, this type of propagation is a daily occurrence, but becomes rare as you migrate towards the mid-latitude.

When the conditions are conducive to the formation of the sporadic "E" clouds, it is possible to have a long communication path such as across the Atlantic Ocean using a frequency of 50 MHz or even above. This is not normally a frequency range that you would expect to be used for such long distances. The average distance that can be expected from sporadic "E" propagation occurence is approximately 2000 kilometers (1240 miles).

One peculiarity of this propagation mechanism is that it is possible for two stations to communicate even though their respective antennas are not pointed at each other. As long as the two stations point their antennas at the same sporadic "E" cloud, good communication is possible.

In many cases sporadic "E" is responsible for long distance reception of TV, FM, and utility station signals. Do not expect a clear and solid signal, but signals in the range of 50 to 200 MHz can be reflected by these ionized clouds and travel long distances. I have personally heard a North African station transmitting in the 50 to 60 MHz range; the receiving site was a forest fire command post in Northern Quebec. At the time, we really did not care if there was a traffic jam in a Moroccan city: we wanted confirmation of a forest fire location!

In the polar areas of the globe, a similar type of propagation can be present: auroral ionization. In this case the phenomena will last all day, but the signal will be fluttery and of poor quality. A similar flutter will sometime be present on the signal of a shortwave station when the path crosses the auroral zone when there is some on-going ionospheric disturbance.

Much research has been done on the phenomena of the sporadic "E," but to date no complete explanation has been put forward. In the last few years, scientists have been investigating one possible correlation: It was noted by the astronauts, while in orbit, that in certain temperate areas of the globe it was possible to see very intense flashes produced by thunderstorms, shooting upward towards the ionosphere in area that had been experiencing strong sporadic "E" propagation. A correlation is now being attempted, but the results are not yet available as the research only started about two years ago.

OPTIMUM WORKING FREQUENCIES (MHz)

For the Period 15 February to 14 March 1997 Flux=80 SSN=16

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
SOUTH AMERICA	21	18	14	11	10	10	10	10	9	7	7	8	10	10	15	19	20	20	20	21	22	23	23	22
WESTERN EUROPE	8	7	7	7	7	7	7	7	8	8	8	0	0	0	10	13	15	15	15	15	13	12	10	9
EASTERN EUROPE (P)	0	7	7	7	8	9	8	0	0	0	0	0	0	0	10	13	14	12	0	0	0	0	0	0
MEDITERRANEAN	10	10	11	11	9	9	9	0	0	0	0	0	0	0	0	14	16	16	17	14	12	0	0	11
MIDDLE EAST (P)	10	10	10	12	10	0	0	0	0	0	0	0	0	0	9	12	13	12	0	0	0	0	0	0
CENTRAL AFRICA	16	15	13	11	10	9	9	0	0	0	0	0	0	0	14	17	18	18	18	19	19	19	19	19
SOUTH AFRICA	12	12	11	10	9	10	10	0	0	0	0	0	0	0	16	19	19	19	20	16	14	13	13	12
SOUTH EAST ASIA (P)	18	19	18	15	0	0	0	0	0	0	9	9	9	9	9	10	12	11	11	0	0	0	0	0
FAR EAST	18	17	17	14	11	10	9	9	9	9	9	9	9	9	9	9	10	10	10	0	10	14	17	18
AUSTRALIA	20	20	20	18	13	0	0	10	10	10	10	10	10	10	9	10	13	12	0	0	15	18	19	20
TO/FROM US MIDWEST																								
SOUTH AMERICA	18	14	11	10	9	9	10	10	8	7	6	8	9	13	17	18	18	19	19	20	21	21	20	20
WESTERN EUROPE	9	9	8	8	8	8	8	8	8	8	0	0	0	13	0	16	17	17	17	17	15	14	12	10
EASTERN EUROPE	7	7	7	7	7	8	8	0	0	0	0	0	0	10	13	15	15	13	11	0	0	0	0	0
MEDITERRANEAN	11	11	11	10	9	9	9	0	0	0	0	0	0	13	16	17	17	17	17	15	12	11	11	11
MIDDLE EAST (P)	10	10	10	10	9	0	0	0	0	0	0	0	0	10	13	15	14	13	0	0	0	0	0	10
CENTRAL AFRICA	16	14	11	10	10	9	9	0	0	0	0	0	0	14	16	18	18	18	19	19	19	20	19	19
SOUTH AFRICA	12	12	11	10	9	10	10	0	0	0	0	0	0	16	18	19	19	19	20	16	14	13	13	12
SOUTH EAST ASIA (P)	16	16	14	0	0	0	0	0	0	0	0	9	8	9	10	12	11	0	0	0	0	0	0	0
FAR EAST	18	17	15	12	0	0	9	9	9	9	9	9	9	9	10	10	11	11	11	10	11	15	18	18
AUSTRALIA	19	20	17	0	0	0	0	10	10	10	10	11	10	10	11	13	13	0	0	0	15	18	19	20
TO/FROM US EAST COAST																								
SOUTH AMERICA	12	10	9	8	9	9	9	9	7	6	6	8	12	15	17	17	17	18	19	19	19	18	18	16
WESTERN EUROPE (P)	8	8	7	7	7	7	7	7	8	7	0	9	13	15	15	16	16	16	16	15	14	12	11	9
EASTERN EUROPE	8	8	8	7	7	8	7	0	0	0	0	0	12	14	15	15	15	13	12	11	9	8	8	8
MEDITERRANEAN	10	10	10	9	8	8	8	0	0	0	0	0	14	16	16	16	17	17	17	14	12	11	11	11
MIDDLE EAST (P)	11	11	10	9	9	0	0	0	0	0	0	0	14	16	17	17	16	14	12	11	11	11	11	11
CENTRAL AFRICA	13	12	11	11	10	10	11	11	0	0	0	0	16	18	20	19	20	20	21	21	21	21	19	16
SOUTH AFRICA	12	11	11	10	9	10	11	11	0	0	0	0	18	19	20	20	20	21	20	16	14	13	13	12
SOUTH EAST ASIA (P)	14	12	0	0	0	0	0	0	0	0	0	8	10	13	13	12	0	0	0	0	0	0	9	9
FAR EAST	16	14	0	0	0	0	0	8	8	8	8	8	9	10	10	0	0	0	0	0	11	14	18	18
AUSTRALIA	19	16	0	0	0	0	0	10	11	11	11	10	10	13	13	13	13	0	0	0	15	18	19	20

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A Look at Some Bells and Whistles

As many of you know, I have a long-standing love affair with older receivers. The reasons are many. I love the warm glow of tubes. I like radios that have components big enough to see, now that my eyes have reached middle age. But I also love their often Spartan operation and limited features. However, as my favorite old receivers become more collectable, even I am less prone to put them into constant use.

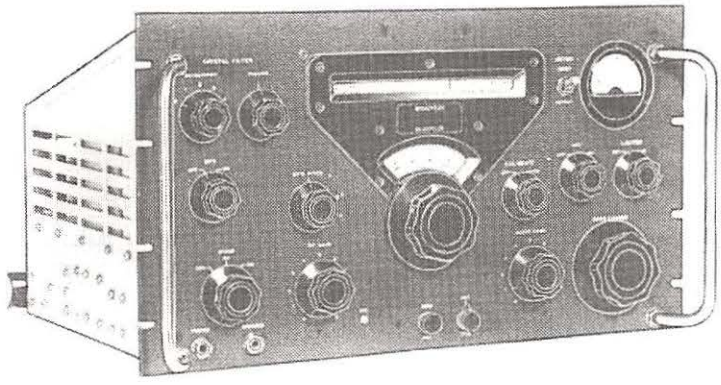
Consequently, modern gear also comes into use here at my shack, and, of course, I keep up on the latest technology and admire much of what I see. But I do notice a tendency to load down modern gear with more bells and whistles than most anybody can reasonably use at one time. It's easy to fall prey to "feature addiction" when shopping for a new receiver, especially if you're a beginner buying your first serious rig. Much of what is tacked onto a receiver is useful but not essential to radio monitoring enjoyment. We need to sort out the bells from the whistles to see what kinds of "accessory" features should be considered fairly necessary, and which are incidental.

Let's start out with a few brief words on general receiver buying. Before your head is turned by any complement of accessories, never forget the essentials. You will *always* want to judge a receiver in terms of its basic performance, not by the number of dials, knobs, and switches it has on the front panel. No quantity of bells and whistles can substitute for what have long been known as the three "S's": Sensitivity, Selectivity, and Stability are the keys to any good receiver. If a radio is weak in any of these areas, all the bells and whistles in the world won't help you pull out that weak station you're trying to hear.

Sensitivity is the receiver's ability to dig out those weak signals. Sensitivity is usually expressed in terms of microvolts and is referenced most often against 10dB to account for natural environmental and electronic noise. Always look for the lowest number when comparing receivers.

Selectivity is a receiver's ability to separate one signal from the other. This is important in the crowded world of the radio frequency spectrum. You will find selectivity listed in terms of bandwidth. 10 kHz bandwidth is normal for common AM broadcast band radios. For successful shortwave reception, look for a bandwidth between 4 and 6 kHz. Single sideband will sound best with a bandwidth of 3 kHz, whereas less than 0.5 kHz is the way to go for copying CW. VHF/UHF monitoring benefits from a bandwidth of 30 kHz or slightly less in most modes of operation. In other words, the selectivity issue will depend mostly on the type of listening you plan to do.

Stability is something to be expected in the modern solid state world. Stability is essentially a function of heat, and modern circuits don't generate all that much. However—especially if you're shopping the used receiver market—any significant frequency drift during normal operation is a sure sign that something isn't working as it should.



This fine old Collins Receiver didn't require modern bells and whistles to get the job done.

Keeping the three "S's" in mind as you do your shopping will get you a receiver that will meet your needs. But what accessories are really important to consider?

Output Jacks

If you're planning on doing serious listening, you will need to get friendly with a pair of headphones. Being able to shut the world out and concentrate on those weaker signals makes all the difference in filling your log book with exotic contacts. So an obvious feature that you will want on any receiver will be a headphone jack. Pay attention to how the jack is wired, because this may affect the type of headphones you can use.

Some modern portables come wired to make use of the inexpensive headphones folks use with their "jogging" radios. There is no particular advantage to stereo over monaural headphones when you're monitoring. What's more important is that the receiver works with a comfortable set of headphones so you can enjoy long periods of listening. If your preferred headphones are equipped with a 1/4 inch plug and your receiver has a subminiature jack, have no fear. That's why Radio Shack sells those "tweenies" to allow you to adapt one to the other.

In addition to the headphone jack, another plus is a secondary "tape output" jack. Regardless of the size of the jack, these tend to come in one of two flavors: attenuated and unattenuated. The attenuated type works with most common tape recorders, while the unattenuated may overload some tape machine inputs. These work well if your recorder has an attenuated input built in or if you have an attenuating patch cord to go between the receiver and the tape deck.

Being able to keep a tape recorder going during your monitoring session assures you won't miss any ID's or other information essential to successful confirmation.

Memories

It seems all but the most inexpensive modern receivers come with some memory complement. The ability to store any number of frequencies for future use is indeed useful. The simple answer here should be, the more the better.

Well, that's almost true. What is equally important is the ability to access and manage that information that is stored in the receiver's memory. How easy is it to locate a particular stored frequency and bring it into use? For

example, let's say a receiver has a 400 channel memory. Is the memory one big file or is it in "banks" of perhaps ten or twenty channels each? Banked memory is, in most cases, much easier to manage than a continuous file.

Also consider how easy it is to store an active frequency in memory. Do you just have to hit a button or two or do you have to reenter the whole shootin' match? A great feature, especially in the VHF/UHF realm is something usually known as "Search and Store." This is the ability to set aside a portion of memory to store active frequencies that are collected from a search of a particular segment of a band. So, as you can see, it's not just the size of the memory, it's what you can do with it as well.

Frequency Entry

I think the receiver that first spoiled most of us in terms of frequency entry was the Sony 2010. The user had several ways of picking their poison when it came to frequency entry. First there was the keypad: just punch it in and go. Then it also had a more traditional dial control with the added feature of two rates of spin for quick or slow movement across the bands. Then you could set it to scan a particular band, also in two ways. It could either pause or stop on an active frequency. Finally, you could punch up a stored memory frequency with one touch of a button or have the receiver scan through all the stored memory frequencies.

The 2010's setup was as close to "Tuning Nirvana" as we are likely to experience. My personal preferences are that keypads are great for picking a frequency you already know, such as that favorite program you listen to each night. But when you're on the hunt in unknown territory, there is no substitute for spinning a dial. So when you go shopping for a receiver, a keypad and dial setup is a good choice with additional tuning features serving as icing on the cake.

Computer Port

The latest generation of receivers makes available an even more interesting way to tune and control things: a computer port that allows your receiver to talk to your personal computer. This can open up dozens of new ways to play radio. First of all, there is remote control of the receiver. Then there is the ability to load information into the receiver's memories or to take information from the memories for further analysis by the computer.

I've recently added the AOR AR8000 portable receiver to my shack (talk about bells and whistles!). This rig has one thousand memories! Now can you imagine how long it would take to hand enter all those frequencies and information? My fingers would have blisters on them. Life is made easier by the fact that this receiver has a computer port. I simply download frequency files into the receiver and my fingers don't get tired at all.

Shopping for a rig with a computer port requires that you get good information about that port's capabilities. Most of the manufacturers provide detailed information that will help you make your choices. Things you will need to know include such things as the nature of the interface between the receiver and the computer. This may mean purchasing or wiring a special cable to get the job done. Many receivers require some sort of intermediary device for successful use. For example, I get my AR8K and my IBM PC compatible communicating with each other through the services of the Optoelectronics Optolinx interface. You need to read the manufacturers specifications and information carefully to make sure everything can be connected before you go randomly plugging one thing into the other.

The only standard is that there are no standards. Right now each manufacturer seems to do their own thing. However, if you get all the right gear and hook it up as recommended, you will open up a whole new world of computer assisted monitoring that will take you to places even the most visionary among us couldn't have dreamed of as little as ten years ago.

But the interface is only half the battle. Your interface depends on good software to really open up the possibilities of the receiver-computer connection. Most receivers that have computer ports are made available with manufacturer's software packages. The more popular receivers can also be operated by any number of after-market software packages, many of which go well beyond the capabilities of the OEM packages. When I last checked there were no less than eight software packages being marketed for my AOR receiver and in saying that I've probably missed a few. Also, if you're handy at programming and the manufacturer has made the system open enough, you can even try your hand at writing your own programs. There is no end to the possibilities that computer assisted monitoring has to offer.

Service

This isn't something you'll find on your receiver or even in the manual, but it is an accessory that needs to be checked out. Spend some time researching your receiver's manufacturer, the outfit you bought your receiver from, and what service after the sale may be like. I do a lot of my own work. Every rig I've ever purchased was bought with the service manual. But by the same token, I make it a point to be on a first name basis with somebody back in the company's technical services division. Good service is the best accessory of all.

These notions should help when you head out to make that next receiver purchase. All of these features are really about making monitoring more fun. And fun is what it's all about.

Kevin Carey, WB2QMY
kevinc@mdsroc.com

1-Watt Wonders

Far below the AM broadcast band, and even beneath the navigation beacon band, there's a sliver of spectrum that is home to dozens of hardy experimenters called LOWFERS (short for Low Frequency Experimental Radio Stations). Under Part 15 of the FCC rules, Lowfers are allowed to transmit license-free from 160 to 190 kHz provided the following conditions are met: (1) Maximum transmitter input does not exceed 1 watt, and (2) the antenna length does not exceed 50 feet (including the feedline). Virtually any transmission mode can be used as long as these rules are followed.

Now that the lower noise levels of winter have arrived, this is a great time to explore this interesting band. Let's look at what it takes to hear a Part 15 Lowfer station.

FIGURE 1: QSL card from ZWI (178.6 kHz), Baldwinsville, NY

Listening Tips

First off, don't expect to hear a Lowfer right away. These experimenters are operating under very restrictive conditions and you'll need to optimize your receiving setup for the best chance at hearing them. Even with everything in peak shape, it may take several tries before you can claim success.

A good antenna is crucial. While I heard my first Lowfer on a random wire antenna, that was 15 years ago in a rural setting with no interfering signals. More likely, you'll need a high performance antenna intended for LF reception, such as a loop or active antenna.

Use a narrow bandwidth setting on your receiver (1 kHz or less) for best results. This limits the effects of adjacent signals and allows you to concentrate on a desired signal. Headphones, too, will help block out household noises and let you focus on the signal at hand.

Tune slowly! This cannot be overemphasized. It's easy to tune right over a weak signal without realizing it was there. I'll often take up to 5 minutes to sift through the range from 160 to 190 kHz. (The tuning speed on many new receivers can be adjusted to accommodate slower tuning.)

Identifying what you hear

Most Lowfer operations are carried out beacon style, with a station repeatedly sending its ID and QSL information in slow Morse code. Usually, the code is slow enough so that you can just jot down the dots and dashes as you hear them and look up the letters afterwards on a code chart, if necessary.

Lowfers have an excellent record for acknowledging receipt of their signals, and many have a special QSL card printed up for the purpose. For many DXers, a Lowfer QSL is the most prized verie. Figure 1 shows a specially designed card received from Howard "Mort" Mortimer, operator of "ZWI" on 178.6 kHz.

To get you started, Table 1 lists some selected Lowfers believed to be active at this writing. Additional Lowfer news and technical topics can be found in *The Lowdown*, Journal of the Longwave Club of America (LWCA). For more information, write the headquarters at 45 Wildflower Road, Dept. *MT*, Levittown, PA 19057.

Want to get started as a transmitting Lowfer? The December '96 issue of *MT* contained a circuit for a basic Part 15 transmitter that can be easily homebrewed for LF or MF operation. (See *DeMaw's Workbench*, Page 102.) Reprints of the article are available from *MT* for $2 plus a self-adressed, stamped envelope.

TABLE 1: Selected Lowfer Listings

FREQ.	ID	LOCATION
175.388	KRY	Chardon, OH
177.900	MPK	Chittenango, NY
178.500	X	Wheatland, WY
178.600	ZWI	Baldwinsville, NY
181.620	RL	Hemdon, VA
182.518	NR	Riverside, CA
183.500	PLI	Burbank, CA
183.544	MEL	San Jose, CA
184.00	RED	Wausa, FL
184.320	IA	Marion, IN
184.514	TEXAS	Haslet, TX
186.100	3GOATS	Talent, OR
186.375	BA	Lancaster, IL
186.750	LEK	Aitkin, MN
186.800	NR	Columbus, GA
187.500	YD	White City, FL
187.650	C	Morro Bay, CA
189.360	TH	Colt's Neck, NJ
189.900	OK	Davenport, OK

TABLE 2: Cuban Beacon Loggings

FREQ.	ID	CITY
212	UCF	Cienfuegos
230	UCL	Cayo Largo del Sur
244	M	Manzanillo
272	UVR	Varadero
278	D	Nueva Gerona
296	UBO	Batabano
300	UGT	Guantanamo
339	UCU	Santiago Antonio Meceo
349	K	Santiago de Cuba
370	UCM	Camaguey
390	UCA	Ciego de Avila, Camaguey
402	USJ	San Julian
430	VA	Varadero
476	CLA	La Habana
500	CLA	La Habana Cojimar

Loggings

One of the exciting things about editing this column is hearing from folks who are relatively new to LF who then go on to achieve notable levels of DXing success. Two names that immediately come to mind are Perry Crabill (VA) and Al Hemmalin (RI), both of whom are frequent contributors to the Loggings section of *Below 500 kHz*.

This month, I'm happy to feature a new contributor, John Mayson of Florida. John recently upgraded to a Sangean ATS-909 receiver and is having tremendous success on the longwave band. Although he has logged many DX catches, one of his specialties is DXing Cuban beacons. Table 2 shows a few of John's most notable Cuban catches.

End Notes

Jacques d'Avignon (VE3VIA) advises that Canadian navigation beacons are now being maintained by Nav Canada, a private contractor. Previously, all maintenance was handled by Transport Canada. Time will tell what effect, if any, this has on Canada's excellent record of QSLing beacons.

John Mayson has already experienced some early success with Nav Canada using the following address for Quebec QSL requests: Nav Canada (NAE), Air Traffic Services, 700 Leigh Capréol, Dorval, PQ H4Y 1G7. He also advises that Nav Canada has a web site at: **http://www.navcanada.ca**

See you next month!

Synthesized FM Stereo Transmitter

Microprocessor controlled for easy freq programming using DIP switches, no drift, your signal is rock solid all the time - just like the commercial stations. Audio quality is excellent, connect to the line output of any CD player, tape deck or mike mixer and you're on-the-air. Foreign buyers will appreciate the high power output capability of the FM-25; many Caribbean folks use a single FM-25 to cover the whole island! New, improved, clean and hum-free runs on either 12 VDC or 120 VAC. Kit comes complete with case set, whip antenna, 120 VAC power adapter - easy one evening assembly.

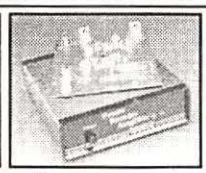
FM-25, Synthesized FM Stereo Transmitter Kit $129.95

Tunable FM Stereo Transmitter

A lower cost alternative to our high performance transmitters. Offers great value, tunable over the 88-108 MHz FM broadcast band, plenty of power and our manual goes into great detail outlining aspects of antennas, transmitting range and the FCC rules and regulations. Connects to any cassette deck, CD player or mixer and you're on-the-air, you'll be amazed at the exceptional audio quality! Runs on internal 9V battery or external power from 5 to 15 VDC, or optional 120 VAC adapter. Add our matching case and whip antenna set for a nice finished look.

FM-10A, Tunable FM Stereo Transmitter Kit $34.95
CFM, Matching Case and Antenna Set. $14.95

RF Power Booster Amplifier



Add some serious muscle to your signal, boost power up to 1 watt over a frequency range of 100 KHz to over 1000 MHz! Use as a lab amp for signal generators, plus many foreign users employ the LPA-1 to boost the power of their FM Stereo transmitters, providing radio service through an entire town. Power required: 12 to 15 volts DC at 250mA, gain of 38dB at 10 MHz, 10 dB at 1000 MHz. For a neat, professionally finished look, add the optional matching case set.

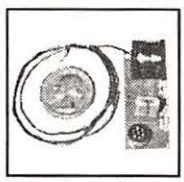
LPA-1, Power Booster Amplifier Kit $39.95
CLPA, Matching Case Set for LPA-1 Kit. $14.95
LPA-1WT, Fully Wired LPA-1 with Case $99.95

Micro FM Wireless Mike

World's smallest FM transmitter. Size of a sugar cube! Uses SMT (Surface Mount Technology) devices and mini electret condenser microphone, even the battery is included. We give you two complete sets of SMT parts to allow for any errors or mishaps-build it carefully and you've got extra SMT parts to build another! Audio quality and pick-up is unbelievable, transmission range up to 300 feet, tunable to anywhere in standard FM band 88 to108 MHz. 7/8"w x 3/8"h x 3/4"h.

FM-5 Micro FM Wireless Mike Kit $19.95

Crystal Controlled Wireless Mike



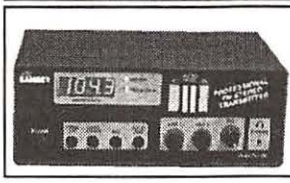
Super stable, drift free, not affected by temperature, metal or your body! Frequency is set by a crystal in the 2 meter Ham band of 146.535 MHz, easily picked up on any scanner radio or 2 meter rig. Changing the crystal to put frequency anywhere in the 140 to 160 MHz range-crystals cost only five or six dollars. Sensitive electret condensor mike picks up whispers anywhere in a room and transmit up to 1/4 mile. Powered by 3 volt Lithium or pair of watch batteries which are included. Uses the latest in SMT surface mount parts and we even include a few extras in case you sneeze and loose a part!

FM-6, Crystal Controlled FM Wireless Mike Kit $39.95
FM-6WT Fully Wired FM-6 ..... $69.95

Call for our Free Catalog !

RAMSEY

Super Pro FM Stereo Radio Transmitter

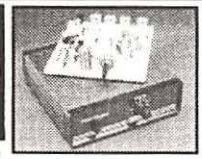


A truly professional frequency synthesized FM Stereo transmitter station in one easy to use, handsome cabinet. Most radio stations require a whole equipment rack to hold all the features we've packed into the FM-100. Set frequency easily with the Up/Down freq buttons and the big LED digital display. Plus there's input low pass filtering that gives great sound no matter what the source (no more squeals or swishing sounds from cheap CD player inputs!) Peak limiters for maximum 'punch' in your audio - without over modulation, LED bargraph meters for easy setting of audio levels and a built-in mixer with mike and line level inputs. Churches, drive-ins, schools and colleges find the FM-100 to be the answer to their transmitting needs, you will too. No one offers all these features at this price! Kit includes sharp looking metal cabinet, whip antenna and 120 volt AC adapter. Also runs on 12 volts DC.

We also offer a high power export version of the FM-100 that's fully assembled with one watt of RF power, for miles of program coverage. The export version can only be shipped outside the USA, or within the US if accompanied by a signed statement that the unit will be exported.

FM-100, Professional FM Stereo Transmitter Kit $299.95
FM-100WT, Fully Wired High Power FM-100. ..... $429.95

Speech Descrambler Scrambler



Decode all that gibberish! This is the popular descrambler / scrambler that you've read about in all the Scanner and Electronic magazines. The technology used is known as speech inversion which is compatible with most cordless phones and many police department systems, hook it up to scanner speaker terminals and you're in business. Easily configured for any use: mike, line level and speaker output/inputs are provided. Also communicate in total privacy over telephone or radio, full duplex operation - scramble and unscramble at the same time. Easy to build, all complex circuitry contained in new custom ASIC chip for clear, clean audio. Runs on 9 to 15VDC, RCA phono type jacks. Our matching case set adds a super nice professional look to your kit.

SS-70A, Speech Descrambler/Scrambler Kit $39.95
CSS, Custom Matching Case and Knob Set $14.95
SS-70AWT, Fully Wired SS-70A with Case $79.95
AC12-5, 12 Volt DC Wall Plug Adapter $9.95

Tone-Grabber Touch Tone Decoder / Reader

Dialed phone numbers, repeater codes, control codes, anywhere touch-tones are used, your TG-1 will decode and store any number it hears. A simple hook-up to any radio speaker or phone line is all that is required, and since the TG-1 uses a central office quality decoder and microprocessor, it will decode digits at virtually any speed! A 256 digit non-volatile memory stores numbers for 100 years - even with the power turned off, and an 8 digit LED display allows you to scroll through anywhere in memory. To make it easy to pick out numbers and codes, a dash is inserted between any group or set of numbers that were decoded more than 2 seconds apart. The TG-1 runs from any 7 to 15 volt DC power source and is both voltage regulated and crystal controlled for the ultimate in stability. For stand-alone use add our matching case set for a clean, professionally finished project. We have a TG-1 connected up here at the Ramsey factory on the FM radio. It's fun to see the phone numbers that are dialed on the morning radio show! Although the TG-1 requires less than an evening to assemble (and is fun to build, too!), we offer the TG-1 fully wired and tested in matching case for a special price.

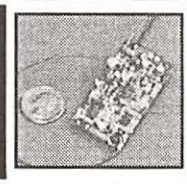
TG-1, Tone Grabber Kit $99.95
CTG, Matching Case Set for TG-1 Kit. $14.95
TG-1WT, Fully Wired Tone Grabber with Case $149.95
AC12-5, 12 Volt DC Wall Plug Adapter $9.95

Mini-Peeper Micro Video Camera

Super small, high quality fully assembled B & W CCD TV camera the size of an ice cube! Provides excellent pictures in low light (2 lux), or use our IR-1 Infra-Red light source to invisibly illuminate an entire room on a pitch black night! Imagine the possibilities... build it into a smoke detector, wall clock, lamp, book, radio. Exact same camera that's in big buck detective catalogues and stores. Kit includes: fully assembled CCD camera module, connectors, interface PC board kit with proper voltage regulation and filtering, hook-up details, even a mini microphone for sensitive sound! Two models available: Wide Angle Lens 3.6mm/f2, adjustable focus lens, 92 degree view; Pinhole Lens 5.5mm/f4.5, 60 degree view. The Pinhole Lens is physically much flatter and provides even greater depth of focus. The camera itself is 1.2" square. The Wide Angle Lens is about 1" long, Pinhole Lens about 1/2", interface PC board is 1" x 2" and uses RCA jacks for easy hook-up to VCRs, TVs or cable runs. Power required is 9 to 14 VDC @ 150 mA. Resolution: 380 x 350 lines. Instruction manual contains ideas on mounting and disguising the Mini-Peeper along with info on adding one of our TV Transmitter kits (such as the MTV-7 unit below) for wireless transmission!

MP-1, Wide Angle Lens CCD TV Camera Outfit. $169.95
MP-1PH, Pin-Hole Lens CCD TV Camera Outfit. $189.95

MicroStation Synthesized UHF TV Transmitter



Now you can be in the same league as James Bond. This transmitter is so small that it can fit into a pack of cigarettes - even including a CCD TV camera and battery! Model airplane enthusiasts put the MTV-7A into airplanes for a dynamite view from the cockpit, and the MTV-7A is the transmitter of choice for balloon launches. Transmitter features synthesized, crystal controlled operation for drift-free transmission of both audio and video on your choice of frequencies. Standard UHF TV Channel 52 (which should only be used outside of the USA to avoid violating FCC rules), and 439.25 MHz or 911.25 MHz which are in the amateur ham bands. The 439.25 MHz unit has the nifty advantage of being able to be received on a regular 'cable-ready' TV set tuned to Cable channel 68, or use our ATV-74 converter and receive it on regular TV channel 3. The 911.25 MHz unit is suited for applications where reception on a regular TV is not desired, an ATV-79 must be used for operation. The MTV-7A's output power is almost 100 mW, so transmitting range is pretty much 'line-of-sight' which can mean many miles! The MTV-7A accepts standard black and white or color video and has its own, on-board, sensitive electret micorphone. The MTV-7A is available in kit form or fully wired and tested. Since the latest in SMT (Surface Mount Technology) is used to provide for the smallest possible size, the kit version is recommended for experienced builders only. Runs on 12 VDC @ 150 mA and includes a regulated power source for a CCD camera.

MTV-7A, UHF TV Channel 52 Transmitter Kit $159.95
MTV-7AWT, Fully Wired Channel 52 Transmitter $249.95
MTV-7A4, 439.25 MHz TV Transmitter Kit $159.95
MTV-7A4WT, Fully Wired 439.25 MHz Transmitter $249.95
MTV-7A9, 911.25 MHz TV Transmitter Kit $179.95
MTV-7A9WT, Fully Wired 911.25 MHz Transmitter $269.95
ATV-74, 439.25 MHz Converter Kit $159.95
ATV-74WT, Fully Wired 439.25 MHz Converter $249.95
ATV-79, 911.25 MHz Converter Kit $179.95
ATV-79WT, Fully Wired 911.25 MHz Converter $269.95

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Call Factory direct: (716) 924-4560

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ORDERING INFO: Satisfaction Guaranteed. Examine for 10 days, if not pleased, return in original form for refund. Add $4.95 for shipping, handling and insurance. Orders under $20, add $3.00. NY residents add 7% sales tax. Sorry, no CODs. Foreign orders, add 20% for surface mail or use credit card and specify shipping method.

Doug Smith, W9WI
72777.3143@compuserve.com

The New EAS

For years, broadcast stations have performed weekly tests of the Emergency Broadcast System, or EBS. I'm sure most of us have learned to "tune out" these announcements—either figuratively or literally—when they come on. But if you have been paying attention, you probably noticed a change in the script last year. Stations began announcing, "The EBS will soon be replaced by the EAS." Well, it's 1997, and the EAS is now with us. And I'm sure you've noticed a difference in the contents of the tests.

The EAS has its roots in the Cold War. Some in the military feared radio stations, especially broadcasters, could be used by enemy bombers as navigation beacons. Others felt that giving the public early warning of an attack by radio and TV could save lives. But there was no organized system for disseminating information.

A scheme called "Conelrad" (CONtrol of ELectronic RADiation) was developed. Confusion of enemy bombers was the aim of this system. When an alert was received from Washington, all stations were to change frequency to either 640 or 1240 kHz and operate in a staggered schedule rebroadcasting government news bulletins. It was hoped the interference between stations on the same frequency, and the rapid switching between transmitter sites, would confuse enemy direction-finding equipment. It was also hoped that having all information broadcasts on two common frequencies would ensure Americans received prompt information and warnings. Incidentally, if you have a radio made in the 1950s or 1960s, you may have noticed two little symbols on the dial, consisting of a triangle inside a circle. These symbols marked the Conelrad frequencies.

As time went on, the shortcomings of the Conelrad system became evident. Nuclear attack seemed less likely. Space-based reconnaissance satellites, attack early warning systems, and other technical developments made direction finding of broadcast stations irrelevant. At the same time, it was recognized that an organized system was needed to alert local audiences of emergencies less serious than nuclear war, but just as deadly to small groups of people. The requirements were met by the "Emergency Broadcast System," or EBS.

Under EBS, stations were no longer required to change frequencies during an emergency. Upon receipt of an alert, primary stations were to broadcast a 23-second alert tone, followed by the contents of the alert. Decoders at secondary stations would be triggered by the alert tone. In case of a real alert, these secondary stations would rebroadcast the emergency information transmitted by their primary station. An envelope with passwords which changed monthly was provided to each station by the FCC; these passwords were to be used to authenticate a real alert, and prevent false alarms.

Within the last few years, the EBS began showing its age. More and more stations are unattended, and more and more TV viewing is of cable channels (also unattended). Under EBS, the alert tone simply meant there was an emergency or a test somewhere within the station's coverage area. A secondary station needed a person to listen to the voice message to know whether there was a real emergency, and if so, whether it involved the station's coverage area. Many stations also complained about the long, annoying alert tone driving away listeners/viewers.

The result is the new "Emergency Alert System," or EAS. The new system uses data bursts to automate operation and reduce the need for the alert tone. Keys on the front panel of an EAS encoder allow the operator to transmit a variety of types of alert, ranging from a weekly test to a tornado warning to a civil disturbance. The data stream also includes the county or counties to which the alert applies.

Each EAS decoder, in turn, can detect and store these data bursts. Decoders can be programmed to automatically suspend normal programming and broadcast an alert. They can store up to two minutes of audio received with the alert, and can rebroadcast it. Decoders can also be selective—they can be programmed to only rebroadcast certain types of alert, and to only rebroadcast alerts for certain counties.

Unlike the old EBS decoders which only monitored one primary station (and failed if the primary station went off the air), EAS systems normally monitor at least two primary stations, and can monitor as many as six.

AM CALL CHANGES

Old Call	New Call	Location
KSBT-1230	KBCR	Steamboat Springs, CO
WPDQ-600	WBWL	Jacksonville, FL
new-780	WPNP	Mulberry, FL
KIOA-940	KXTK	Des Moines, IA
KLVJ-1240	KMHI	Mountain Home, ID
WSFN-1600	WMHG	Muskegon, MI
KQRS-1440	KDIZ	Golden Valley, MN
KEGE-980	KKMS	Richfield, MN
KJEL-750	KBNN	Lebanon, MO
KHKR-680	KKGR	East Helena, MT
WAIU-1000	WRNJ	Hackettstown, NJ
KIRS-1590	KIHM	Sun Valley, NV
WODZ-1450	WFRY	Rome, NY
KXTN-1310	KPOZ	San Antonio, TX
WRVH-910	WRNL	Richmond, VA
WTMM-990	WVNZ	Richmond, VA

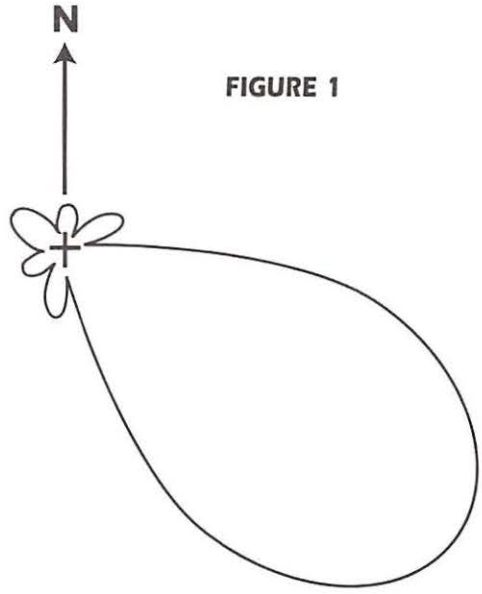


FIGURE 1

WNQM-1300 Night antenna pattern

This drawing shows where WWCR sister station WNQM's signal goes at night. DXers across East Tennessee, North Georgia, and South Carolina should notice an improvement in this station's signal when their new 50,000 watt transmitter is complete.

FIGURE 2: *You may have noticed that WNQM's antenna doesn't radiate much signal straight north. Grand Rapids, Michigan, station WOOD, also on 1300 kHz, is one of the stations WNQM protects.*

■ What will you hear?

Weekly tests are still part of the EAS. Three weeks a month, you'll hear a "Required Weekly Test" sometime between 8:30am and sunset. This test will contain three brief data bursts (the "header," which identifies the transmission as a test), then three more even shorter bursts (the "end of message" code). Most stations probably accompany this data with voice announcements informing their audience of what's going on.

The fourth week, you'll hear a more involved "Required Monthly Test." The schedule for these tests is set by state emergency management officials, but I understand most states will rotate these tests throughout the day.

Monthly tests start with what sounds like the same data bursts as weekly tests. (They're actually slightly different, identifying it as a monthly, not weekly, test.) Next, the old two-tone alert signal is transmitted for 8 seconds. Under EAS, this signal serves only to inform people that some kind of emergency message is to follow; it's not intended to trigger automatic decoders anymore. After the alert signal, a voice message describes the alert as a monthly test. Finally, the same "end of message" code used with the weekly test is transmitted. On TV stations, a text crawl is used to explain what's happening to deaf viewers. (Or those who, like me, tend to watch TV with the sound turned down!)

In case of a real alert, you'll hear something very similar to a monthly test. The difference is that the voice announcement will make it obvious a real emergency is in progress. If you had a decoder, the data streams in the "header" would also provide information about the emergency.

■ Other radio services

One of the touted features of the EAS is the ability to transmit its data streams over other radio services, and for other services to decode them and use them to alert their users. You may well hear EAS data on VHF and UHF repeaters used by your state's emergency management authorities. There has even been discussion of amateur repeaters using EAS decoders both as a backup to commercial links, and a way of alerting ham weather spotters of severe weather watches.

■ Bits and Pieces

• Regular digital broadcasts are coming to Canada. Master FM, the cooperative of private and government broadcasters that operates the CN Tower transmission site in Toronto, has begun work on a microwave digital transmitter to simulcast their 14 member stations. In November of 1996, the CBC decided to apply for licenses for DAB transmitters to serve 75 percent of Canada's population. It's unknown what effect recent CBC budget cuts will have on these plans, but in November they hoped to have signals on the air in Toronto and Montreal by the end of this year.

MT reader Paul Casey in suburban Ottawa sent an article on the subject from the *Citizen*. He also asks "Where can I buy a digital FM receiver?" So far, I don't think you can buy one! The technology is new, and standards are not yet set in many countries. Indeed, I believe a U.S. DAB standard is at least two years away. While broadcasts have also begun in the United Kingdom, that country uses an incompatible 220 MHz frequency band.

• Most of us have heard of WWCR, the popular shortwave station in Nashville. You may not be aware that WWCR has a sister AM station, broadcasting from the same site. Their WNQM (1300 kHz) has taken advantage of recent FCC rule changes which allow regional-channel stations (see December 1996 *American Bandscan*) to use more than 5,000 watts power. On October 7, WNQM was granted a construction permit to increase power to 50,000 watts. As you can see from the graphic, listeners in northern Georgia and South Carolina should receive a very strong signal from this station.

It's now the peak of the AM DX season. Share your catches, tips, and hints with your fellow *MT* readers. Write Box 98, Brasstown NC 28902-0098, or by email to 72777.3143@compuserve.com. Good DX!

DX TEST BULLETIN

These special broadcasts provide a unique opportunity to hear and identify the following stations. If you hear these broadcasts, please report to the address provided.

Mon Feb 3 - Thur Feb 27, 1996 - WWCN-770 (P.O. Box 9600, Estero, FL 33928; daryl@trucom.com) will test at 1,000 watts directional 12:30-1:00 a.m. EST every Mon through Thurs during the month of February. Morse code ID's inserted during regular programming of old-time radio serials and vintage comedy. Send reports to: Mr. Joey C. - Program Director.

Mon Feb 3, 1997 - KATZ-1600 (10155 Corporate Square Drive, St. Louis, MO 63132) will test at 5,000 watts 2:00-2:30 a.m. EST (0700 - 0730 UTC). Morse code ID's, test tones, and polkas or march music. Send reports to: Mr. Daryl W. McQuinn (N5VAY) - Director of Engineering.

Mon Feb 10, 1997 - WHLO-640 (2780 South Arlington Road, Akron, OH 44312-4742; daveyjohn@aol.com) will test at 5,0000 watts daytime directional pattern 1:00-1:30 a.m. EST (0600 - 0630 UTC). Morse code ID's, test tones, and "special" music. Correct reception reports will be verified with a special QSL card, and must contain exact program details. The station asks that there be no phone calls during the test. Send reports to: Mr. Dave Johnson - Chief Engineer.

Sun Feb 16, 1997 - WBOW-640 (P.O. Box 35, Terre Haute, IN 47808) will test at 250 watts nondirectional between 12:30-1:00 a.m. EST (0530 - 0600 UTC). Morse code ID's, voice ID's, and music by a famous horn player. Send reports, including an SASE, to: Mr. Kevin Berlen - Assistant Chief Engineer.

Sun Feb 23, 1997 - KIMM-1150 (Box 8205, Rapid City, SD; rrr@rapidcity.com) will test at 500 watts directional between 2:00-3:00 a.m. EST. Morse code ID's and voice ID's. Send reports, including an SASE, to: Mr. Gary Peterson (K0CX) - Chief Engineer.

These tests were arranged by J.D. Stephens for the International Radio Club of America Courtesy Program Committee. (Send 32-cent stamp, or US$1 or 1 IRC if overseas, to P.O. Box 1831, Perris, CA 92572-1831 for sample IRCA bulletin.)

OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller
George.Zeller@acclink.com

Radio Free Speech Relaying Other Pirates

With the unfortunate demise of Richard T. Pistek's very active **North American Pirate Relay Service** in late 1996, some worried that it would be more difficult for pirate stations to find relay transmitters. But, Bill O. Rights of Radio Free Speech is filling the void. Several transmissions of the **Radio Free Speech Relay Service** have already led to North American and European pirate signals bouncing off the ionosphere on 39 meters. Our reporters note that his new AM transmitter puts out a good fidelity signal, often with solid signal strength.

Clandestines Active

NASWA Executive Director Rich D'Angelo of Wyomissing, Pennsylvania, checks in with some clandestine logs from the recent DXpedition he attended at Gifford Pinchot State Park. He heard the **Voice of the Iraqi People** on 9568.3 kHz from 1823-1840 UTC with male and female announcers. Rich credits fellow DXpedition attendee Dave Valko of Dunlo, Pennsylvania, for a definite ID on the station. Rich also bagged **Radio Mogadishu, The Voice of the Somali** on 6854 kHz from 1956-2025 UTC. This one has news in English at 1957 UTC. Ed Rausch of Cedar Grove, New Jersey, noted them signing on in upper sideband at 0310 UTC.

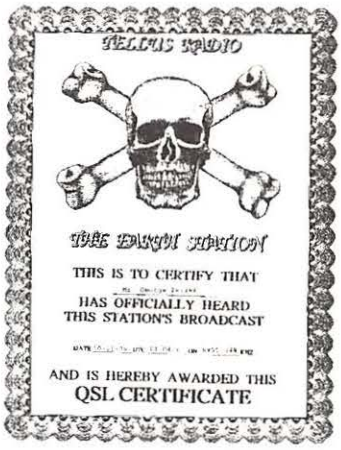
MT contributor Stanislav Mekhonoshin of Perm, Russia, checks in with some clandestine logs. He heard **Radio Afghanistan** with a "Baroi-e Afghanistan" ID on 7100 kHz at 1400 UTC. The **Voice of Mojahed of Afghanistan** rolled in on a variable 7000 kHz at 1220 UTC. Stanislav noted **Voice of the Struggle of Iranian Kurdistan** on variable 4250 kHz at 1430 UTC. He also heard the **Voice of the Islamic Movement in Iraqi Kurdistan** in Arabic on 4135 kHz for an hour at 1700 UTC. Unfortunately, propagation to North America on all of these would be unlikely at these times.

Harald Kuhl checks in from Germany, where he heard **Voice of the Communist Party of Iran** through jamming on variable 3885 kHz for an hour starting at 1655 UTC. Another Iranian, **Voice of Mojahed,** came in on 4660 variable at 1700 UTC. He bagged **Voice of the Worker** just before sign of at 1810 UTC on 3935 kHz. Harald also found **Voice of Iraqi Kurdistan** on 4070 kHz from 1843-1928 UTC.

Free Radio Weekly

The *Free Radio Weekly* internet newsletter is an excellent supplement to *MT's* Outer Limits. It arrives via e-mail every week. You can't beat the price; it is *free* to persons who contribute. You can contact them at **piradio@usa 1.com** for more information. Veteran pirate chaser Chris Lobdell of Stoneham, Massachusetts, edits *FRW*, with equally experienced Neil Wolfish of Toronto, Ontario, as Assistant Editor.

If your tastes run toward Europirates, Swedish Report Service offers a similar weekly list of pirate logs via the internet. They charge a small fee, but the information is quite valuable. SRS can be reached via Ostra Porten 29, S-422 54 Ytterby, Sweden, or using **srs@srs.pp.se** for e-mail. Their world wide web site at **http://www-pp.hogia/net/jonny/** is another alternative for further information.



A name reversal and new QSLs from Tellus Radio

Radio Free Lenawee Busted

The FCC issued a Notice of Apparent Liability November 22 to Rev. Rick Strawcutter of Adrian, Michigan, alleged operator of Radio Free Lenawee. The station used 97.7 MHz from the Church of the Lord Jesus Christ in Adrian Township. FCC assistant bureau chief John Winston said that Pastor Strawcutter could be fined $10,000, and could have his equipment confiscated. Thanks go to *MT* reader Artie Bigley of Toledo, Ohio, for *Toledo Blade* articles on the bust.

What We Are Hearing

Your pirate loggings are always welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address at the top of the column. All frequencies are in kHz, with times in UTC.

North American pirate stations listed here use the following addresses: PO Box 1, Belfast, NY 14711; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 28413, Providence, RI 02908; PO Box 146, Stoneham, MA 02180; PO Box 605, Huntsville, Alabama 35804; PO Box 1073, Sierra Madre, CA 91025; PO Box 293, Merlin, Ontario N0P 1W0; Postfach 220342, D-42373 Wuppertal, Germany; and PO Box 510, 4010 Basel, Switzerland. For return postage, enclose three 32¢ stamps in the envelope to USA addresses. $2 US or two International Reply Coupons go to foreign maildrops.

6YCAT- 6955 at 0345. This Jamaican pirate plays songs about cats. Addr: Providence. (Rich and Talea Jurrens, Katy, TX; Barry Williams, Enterprise, AL; D'Angelo)

Alan Masyga Project- 15043 at 0400. The station plays Alan Parsons Project rock, with ID's based on a well-known pirate DXer. Addr: Providence. (Michael Prindle, New Suffolk, NY; D'Angelo; Jurrens)

Anonymous Radio- 6955 at 0245. John Doe plays rock and announces an address in Anytown, USA, indicating that logs should not be sent to *MT* or *The ACE*. Addr: None. (Ralph Fellows, Fellows, CA)

Anteater Radio- 6955 at 2245. This new one has tested with rock music so far. Addr: None, asked for alt.radio.pirate messages. (Charles Crawford, Henderson, KY; Wolfish;)

Caribbean Sound System- 6955 at 2215. Count Whip mainly plays reggae and ska from a cruise ship, much like Allan Weiner plans to do sometime in 1997 from a location that he has not yet disclosed. Addr: Stoneham. (Shawn Axelrod, Winnipeg, Manitoba; Harold Frodge, Midland, MI; Wolfish; Crawford)

Free Hope Experience- 6955 at 0330. Although winter conditions mean that 39 meters dies for short skip not long after sunset, Major Spook sometimes gets long hops out of the ionosphere. Addr: Blue Ridge Summit. (Williams; Wolfish; Ryan)

Happy Hanukkah- 6955 at 2030. As usual, the holiday season brought a return of their holiday music, stories, and show tunes. Addr: Merlin. (Cathy Zylka, North Tonawanda, NY; Lee Silvi, Mentor, OH; Wolfish; Frodge; Murphy)

Hitch Hiker's Guide to the Galaxy Radio- 6950 at 2200. Their broadcasts consist of space travel dramas, obviously with a TV show theme. Addr: Blue Ridge Summit. (Robert Ross, London, Ontario; Ross Comeau, Andover, MA; Nick Terrence, Huntington, NY; Murphy; Silvi; Wolfish;

Crawford; Frodge)

Jerry Rigged Radio- 6955 at 2300. One recent program analyzed "Pirate Radio Syndrome," a heretofore unknown disease. Addr: Providence. (Jurrens)

K-9 Kitty Radio- 6955 at 2145. Their professionally produced mix of rock, jingles, and funny political comedy is very entertaining. Addr: None. (George Zeller, Cleveland, OH; Pat Murphy, Chesapeake, VA; Wolfish)

KAMP- 6955 at 2130. Not many DXers get stations named after them, but *MT* contributor Alan Masyga gets more than one. Addr: Blue Ridge Summit. (Silvi; Wolfish; Axelrod)

KCHZ- 6955 at 0400. Yukon Jack hosted this new one when it appeared last Halloween with a relay of Voice of the Abnormal. Addr: Sierra Madre. (Gigi Lytle, Lubbock, TX; Randy Ruger, North Hollywood, CA)

KGDR- 6955 at 0100. Grateful Dead music constitutes the playlist on this station, but reverb in the announcer's voice sometimes makes copy tenuous. Addr: Providence. (Axelrod; Frodge; Williams; Wolfish; Prindle)

KMCR- 6956 at 0145. Magic Mike and Wanda play rock music. The station is a great DX catch outside the west coast, so they sometimes transmit Morse code CW ID's. Addr: Blue Ridge Summit. (Ryan)

KOLD- 6955 at 0230. The big band music on Aldo Batista's station sometimes has a holiday theme. Addr: Stoneham. (Mike Ryan, Buena Park, CA; Jim Laughlan, Youngstown, NY)

KWJC- 1640 at 1230. Light easy listening music has regularly inhabited the medium wave bands lately, but most logs of this one are from the west coast. Addr: None. (Axelrod)

Military and Fishermen- 6955 at 0000. Not everything on this frequency is a free radio station. Jeffrey heard WGY912 and KKN50 with voice military traffic, although this may be bogus as KKN50 always uses Morse code CW. Neil notes virtually daily traffic from fishing fleets. Addr: None. (Jeffrey Willson, Ft. Lauderdale, FL; Wolfish)

Mystery Radio- 6955 at 0000. Their format varies somewhat, but new age and jazz music are staples. Addr: Stoneham. (William Hassig, Mt. Prospect, IL; Jurrens; Wolfish; Williams; Ryan; Frodge; Prindle)

ORTQ- 6955 at 1745. Their Quebec programming of ballads and folk songs is the only regularly active French speaking pirate. Addr: Providence. (Howard E. Lyon, Oz)

Pirate Radio Boston- 6955 at 1645. Charlie Loudenboomer and Mr. X team up for shows of rock and reggae music, plus calm banter about pirate DX activity. Addr: Stoneham. (Richard Amirault, Boston, MA; Murphy; Wolfish; Lyon)

Radio Azteca- 6955 at 1915. Bram Stoker has now produced nearly two dozen hilarious DX parody shows. Addr: Belfast. (Larry Michalski, West Seneca, NY; Wolfish; Zylka; Murphy; Frodge; Silvi)

Radio BLANDX- 6950 at 0215. Their DX comedy, stimulated originally by Don Moore's DX bulletin parody *BLANDX*, is highly amusing. Addr: Blue Ridge Summit. (D'Angelo; Jurrens)

Radio Eclipse- 6955 at 1615. The calm announcer on this new one says that he's made nearly a dozen broadcasts, and that he hopes to get a maildrop once a series of test broadcasts is finished. Addr: None. (Lyon; Wolfish, Zeller; Prindle)

Radio EuroGeek- 6955 at 2000. If you missed this hilarious parody of Europirates prior to the special St. Helena Day broadcast last fall, you might hear repeats of the transmission in the 39 meter pirate band. Addr: Providence. (Frank Carson; Williams; Jurrens; Ruger; Crawford; Ross; Prindle; Ryan; D'Angelo)

Radio Free Spin 96- 6955 at 0145. This new one mixes rock music with Rush Limbaugh attacks on President Clinton. Addr: Huntsville. (Williams)

Radio Free Speech- 6955 at 2245. Bill O. Rights' political humor and pirate advocacy booms forth with a new AM transmitter at various times of day. Addr: Belfast. (Crawford; Ross; Lyon; Frodge; Williams; Prindle; Wolfish; Silvi; Crawford; Murphy; Ryan; Hassig)

Radio Fusion Radio- 13900 at 1630. This rap music station holds the North American record for reception in the Western Hemisphere, Europe, and Asia. Addr: Providence. (Wolfish; Jurrens; Silvi; Frodge)

Radio KAOS- 6955 at 0130. Major Spook features rock music, comedy, and commentary on pirate radio. Addr: Belfast. (Amirault; Jurrens; Williams; D'Angelo; Ross; Ruger; Prindle; Silvi; Ryan)

Radio Nine- 6950 at 0300. Their hard rock format distinguishes them from the other numbered pirates. Addr: Providence. (Jurrens)

Radio Piraña- 6925.7 at 0245. Jorge has moved his Europirate to South America, where he now is an excellent DX catch. Put this frequency in one of your receiver's memories; you'll want to check it over and over. Addr: Wuppertal. (Ross; Frodge)

Radio Sparks- 6955 at 2330. This Swiss Europirate rocker is heard via licensed SWBC relays, but it still appears on the North American pirate bands. Addr: Basel. (Williams; Jurrens)

Radio Three- 6955 at 2230. Gruff-voiced Sal Amoniac programs syrupy rock oldies and seasonal music. Addr: None. (Joel Gosse, St. Paul, MN; Ross; Silvi; Wolfish; Ryan; Prindle; Frodge; Williams; Crawford; Hassig)

Radio USA- 6959 at 2200. It's hard to believe, but Mr. Blue Sky is celebrating his 14th anniversary as a pirate this year. Punk rock and comedy sketches still dominate his productions. Addr: Belfast. (Axelrod; Williams)

Tellus Radio- 6955 at 0315. Radio Tellus reversed the order of its station name last fall. It's still quite active with rock music programming. Addr: Providence. (Frodge; D'Angelo; Wolfish; Prindle; Jurrens; Crawford; Williams; Ryan; Silvi; Ruger; Ross)

The Crooked Man- 6955 at 2145. This may be the most bizarre station in pirate history. Mr. Crooked's stream of consciousness analysis is stilted by an admitted psychiatric abnormality caused when he fell out of the Hindenberg on his head. Addr: None; old Washington drop defunct. (Silvi; Wolfish; Frodge; Zeller)

Up Your Radio Shortwave- 6955 at 1445. Even after the election, Willy B. Serious still attacks Republicans with clever comedy segments. Addr: Blue Ridge Summit. (Andrew Everhart; Carmel, IN; Williams; Crawford; Prindle; Crawford; Wolfish; Ryan; Murphy)

Voice of Bob- 6955 at 2200. Rev. Ivan Stang's "Hour of Slack" program from Dallas, featuring Ward Cleaver lookalike "Bob" with his pipe, sometimes appears via pirate relay on this station. It's a superbly clever and very elaborate parody of fundamentalist religion. Addr: Belfast. (Murphy; Wolfish)

Voice of Christmas- 6955 at 1615. What holiday is associated with this one, which uses an interval signal of "O Tannenbaum" on a music box? Who is buried in Grant's tomb? Addr: Providence. (Gosse; Wolfish; Crawford)

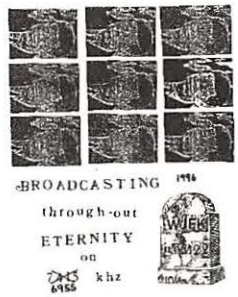
Voice of Helium- 6955 at 2200. The funny comedy on this station is related to gases, mainly Helium. Addr: Blue Ridge Summit. (Silvi; Crawford)

Vox America- 6955 at 2000. They play rock music, but comedy material is mixed in. Addr: None; says working on it. (Lobdell; Frodge; Silvi; Zylka; Ryan; Wolfish; Prindle)

WBST- 6955 at 2230. This one used to appear at Halloween, using a "WBST brings out the beast in me" slogan. But, they now pop up at random times. Addr: None; Washington drop defunct. (Frodge)

WDRR- 6955 at 2030. This hard rocker has reactivated, with its professionally produced identification jingles. Addr: Belfast. (Jeff Arndt, Manitowoc, WI; Wolfish; Crawford; Murphy)

WJFK- 6955 at 1415. Once a year this station appears around November 22 to memorialize the anniversary of President John F. Kennedy's assassination. Addr: None, verifies logs in *The ACE*. (Arndt; Wolfish; Silvi; Frodge; Crawford; Prindle)



WJFK memorializes President Kennedy again.

WLIS- 13900 at 1800. Jack Boggan's station, which plays shortwave broadcast station interval signals as pop tunes, has been widely heard during its six year run on the pirate bands. Addr: Blue Ridge Summit. (D'Angelo; Jurrens; Williams; Crawford)

WMPR- 6955 at 0200. Although somewhat mysterious, this one has been more active lately with a "Micropower Radio" slogan, dance music, new age tunes, and jazz. Addr: None. (Jurrens; Ryan; Wolfish; Frodge; Crawford; Prindle; Williams; Zeller)

WPN- 6955 at 0115. The World Parody Network lives up to its name with comedy, but rock music is also regular fare. Addr: Huntsville. (Williams; Ryan; Hassig; Axelrod)

WREC- 13900 at 1900. P. J. Sparx has joined the parade of pirate stations using this frequency during the daytime. But, he's also regularly active on 39 meters with rock and comedy. Addr: Belfast. (Amarault; Jurrens; Silvi; Murphy; Wolfish; Prindle; Williams; Crawford)

WRV- 6955 at 1815. Pirate Pete still infects the airwaves from the Radio Virus, the station that nobody wants to catch. Addr: Belfast. (Wolfish)

WSM- 6955 at 2130. The country music on this one is of oldies vintage. It is no coincidence that the call letters were stolen from the 50 Kw medium wave voice of Nashville. Addr: Huntsville. (Prindle)

X Files Radio- 6957 at 2230. When I first heard this station, I misidentified it as Exiles Radio. Obviously the ID on this rock music pirate came from the television program. Addr: Merlin. (Prindle)

Ike Kerschner, N3IK

DX for No Code Techs

A no code tech wanting to work DX has three options available: First is to buckle down and learn Morse code to upgrade his ticket. A second is to spend a lot of time tuning six meters waiting for a band opening. The third and most reliable is to work DX via satellite communications. Let's discuss the third option at some length.

Space communications need not be difficult or expensive. In fact it is possible to use a two meter FM HT and your SWL receiver to operate through at least one of the available satellites (Radio Sputnik 10 or RS-10). Using this set-up you must key your HT using your push to talk button to send Morse code, but for a no code tech that is not really an option. Therefore, depending on your equipment, to get your SSB signal into a satellite and back to Earth expect to spend $300 to $500 for a rig and receiver that cover the necessary bands.

Basically, each satellite carries several different transponders (a transponder is a type of repeater that covers a bandwidth of several kilohertz). Each type of transponder is assigned a "mode" depending on the uplink (your transmission to the satellite) and downlink (satellite to you) frequencies of that particular unit. For this discussion we will concentrate on Mode A transponders, whose uplink is 2 meters with a downlink of 10 meters.

Equipment

You will need a 2 meter rig capable of SSB operation, plus a receiver that covers 10 meters. A transmitter power of 10 watts is more than adequate to access RS-10. For an antenna, I use a Ringo Ranger for the uplink, and a dipole on the downlink receiver. At my station a Kenwood TR-751A at 25 watts provides all the power required to access RS-10 (in fact the five watt level is more than adequate). If you are using an older receiver for the downlink, you may want to add a preamplifier to improve the sensitivity of the unit, as signals from the satellite tend to be weak.

If you have none of the aforementioned equipment, expect to pay $200 to $500 for an all mode 2 meter transmitter (used) and $100 to $300 for the downlink receiver. Antenna cost can be minimal, as a simple wire dipole for receiving the downlink is adequate, and a vertical or turnstile (crossed dipoles) for your uplink can be built for ten dollars or less.

Accessing the Bird

Normally RS-10 is available six times a day in three morning passes and three evening passes. Average time per pass is about 15 minutes. There are two ways to know when the satellite is available to you. The first is by simply letting the downlink receiver sit on the beacon frequency (RS-10 has two beacons: one at 29.357 MHz, the other at 29.403 MHz). When you hear the beacon, the satellite is within range of communications.

The second and preferred method is to use a tracking program on your computer that will give you the times when the bird is available to you. I use TrakSat, although there are several excellent programs available. (You can request a software catalog for space communications from AMSAT. Just send an SASE to AMSAT PO Box 27, Washington DC 20044.)

The uplink passband for RS-10 is 145.860-145.900 MHz and the downlink is 29.360-29.400 MHz. With your 2 meter transmitter set somewhere within the uplink passband you should be able to hear your own signal on the downlink receiver. Once you hear your own signal, rest assured there are many stations able to hear you.

I suggest just listening to QSO's on the downlink for a few passes to get the general idea of how to operate through the satellites.

RS-15

A second Mode A satellite that has even better coverage than RS-10 is RS-15. Uplink for RS-15 is 145.858-145.898 MHz, with a downlink of 29.354-29.394 MHz. However, since this bird is in a higher orbit you will need either a steerable antenna or more power. On some passes (directly overhead) my 25 watts and Ringo Ranger antenna will access RS-15, but a power level of 75 to 100 watts would be better if you do not want to use a directional antenna. (If you opt for a steerable antenna it will need to be repositioned several times during each pass.)

Expectations

Most of us in the USA will be able to work all states and several continents via RS-10. If we make the extra effort to use RS-15, all continents and DXCC becomes a real possibility. In any event, satellite communications are a lot of fun plus being extremely educational.

The above information will get the newcomer started in space communications; however, we have barely scratched the surface. Other satellites and modes offer a wide variety of hamming experiences; future columns will carry information on these advanced modes.

Additional information on space communications is available via AMSAT (at the address mentioned above) and the ARRL (225 Main St. Newington, CT 06111).

High Frequency Activity

With the rising solar flux, there have been more openings on 10, 12, and 15 meters. While not a daily occurrence, the return of DX activity to these bands is certainly welcome. In early December 160 and 80 meters have been providing good activity with all continents being audible on 80 meters. Forty meters has been a regular hotbed of DX with many rare stations being worked. Expect the bands to continue this way through April and into May.

Pay attention to 160 and 80 meters as we move into the spring equinox (March, April, and early May) when propagation between the antipodes (Australia, New Zealand, etc.) becomes easier on these bands. Best times will be an hour before sunrise to about half hour after sunrise, and again in the evening a half hour before sunset to a half hour after sunset.

73 de Ike, N3IK

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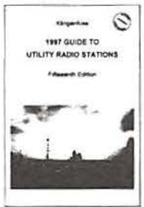

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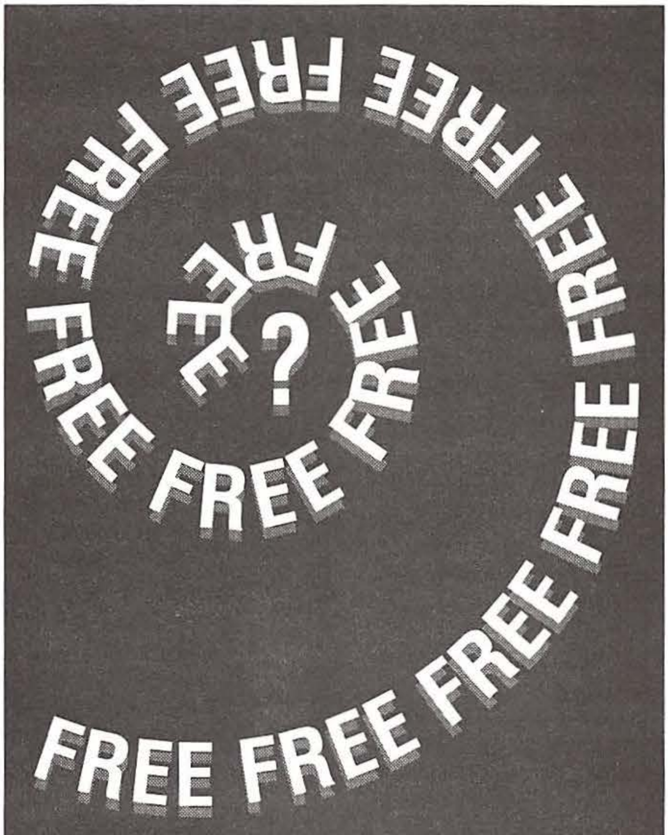

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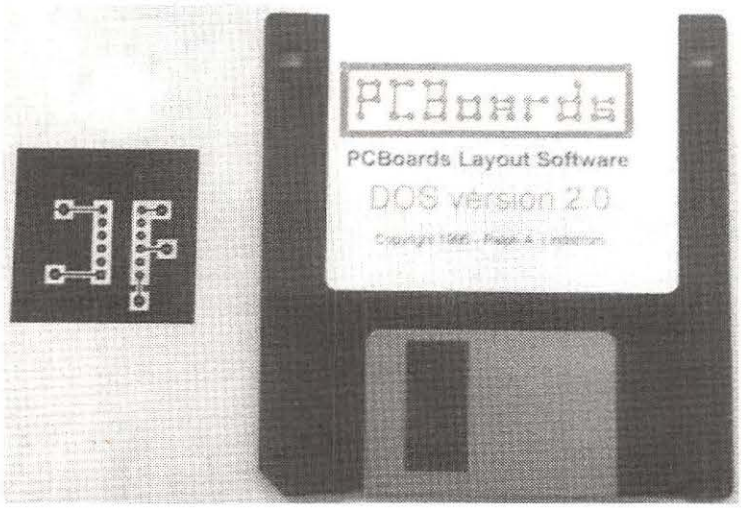
Doug Demaw, W1FB

The Home-Brewed PC Board

Letters received from readers indicate an unwillingness on behalf of some experimenters to use homemade circuit boards for magazine projects. The usual barrier turns out to be (1) lack of knowledge regarding initial layout methods and (2) how to transfer the PC pattern to the copper-clad board material.

This article explains the basics of using quadrille pads (graph paper) to develop the parts layout prior to transferring the design to the PC board for etching, in cases where the article does not already include a PC board pattern.



Preliminary Steps

Gather the parts that go into your project. Use an 8-1/2 x 11 inch sheet from a pad of quadrille paper for drawing your layout map.

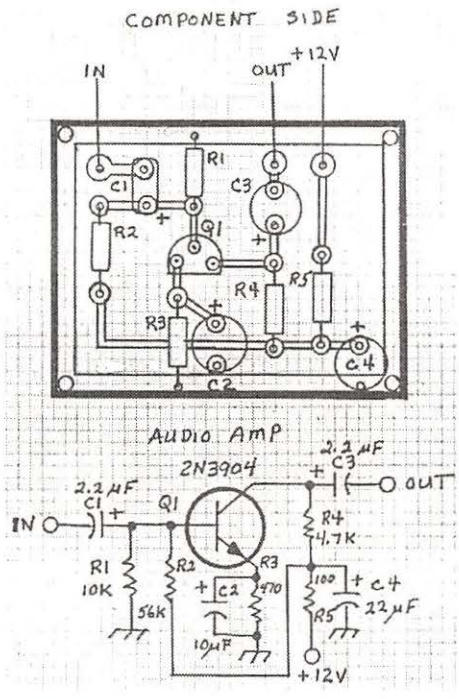


FIGURE 1: *Example of preliminary pencil layout on quadrille paper. The pencil lines have been inked to provide greater detail.*

If you plan to use the PCboard DOS software[1] mentioned later in this article, select quadrille paper that has the small 1/10-inch light blue squares. Larger squares are okay for templates that are made with donut pads and layout tape.

Commence layout by starting at the left side of the circuit diagram. Give each part a number, such as C1, R1, D1, etc. Use a pencil to develop small circles (pads) for mounting capacitors, diodes, ICs, resistors, transistors and other components. Lay the parts on the paper to ensure you are providing sufficient room for them to be mounted. Label each part as it is added to the plot. This will help you keep track of which parts have been used as you proceed.

Draw lines to join the pads wherever appropriate. Likewise for the pads that connect to B+ and ground. Keep the connecting leads as short and direct as practicable to minimize unwanted stray inductance in the PC board conductors.

Check from time to time to make sure no component ends up atop of or in the way of another one. When you have finished your plot, draw a 1/4-inch border around the perimeter of the pattern. The main circuit-ground conductor should connect to this border. Leave room at each corner for a 4-40 screw hole. The holes will allow you to mount the board on the chassis with metal standoff posts, thereby connecting your PC board ground to the chassis or cabinet ground. Figure 1 is a pencil layout that has been darkened with ink on completion.

Keep in mind that the end product is viewed from the component side of the board. However, you can do the layout from the etched side of the board if you prefer.

The Next Step

You are now ready to make a clear-film positive of the pattern. I use a piece of clear plastic that has been cut from an 8-1/2 x 11 inch file protector. These are available from office supply stores. Lay the plastic over your pencil sketch. Apply Scotch tape at two edges to prevent the plastic from moving about on the pattern as you work.

Use dry-transfer donut pads and lines to duplicate the pattern on the plastic. These drafting aids are available at Radio Shack stores. You may prefer to use Datak donut pads and tapes for your layout. They are easy to use and are more durable than dry transfers. Some mail order electronics suppliers sell this product. Also check your drafting supplies store.

The completed clear-plastic layout can now be used for photo-etching your PC board. Photo-etching kits and layout materials are available from Hosfelt Electronics (catalog no. ER-4).[2]

It is worth mentioning that etch-resistant pads and lines are also available. These products enable you to do your layout directly on the copper surface of a PC board.

Computer PC Board Design

I use a DOS program called PCboards. An example of a computer-generated pattern I made with this software is seen in figure 2. The user has the option of doing the layout as seen from the etched or component side of the board. PCboards is not an autorouting system. All lines must be run at 90-degree angles. Autorouting software lets the computer seek and wander through the pattern of pads. The circuit points are joined with snake-like conductor lines.

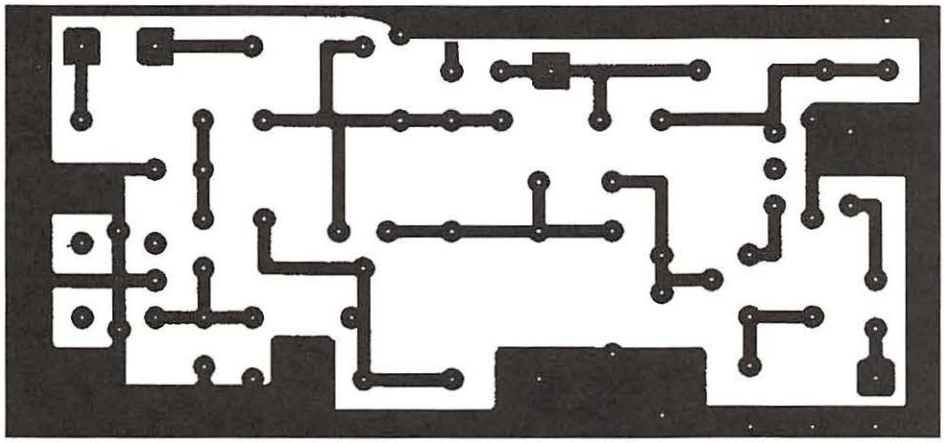


FIGURE 2: *Example of a PC board layout that was done with PCboards software under DOS with an IBM-compatible computer.*

During layout, each cursor move equals 1/20 inch. Therefore, quadrille paper with the 1/10 inch blue squares is ideal for the preliminary layout. Each square of the paper requires two cursor moves on the computer screen. The software has a library of parts that can be called up and placed in the work area on the screen. Such components as capacitors, resistors, diodes, and ICs, with standard manufacturers' lead spacings, are available. The designs can be saved progressively, and on completion, should changes need to be made later. The program works with laser or ink-jet printers.

The completed pattern is printed and transferred to PnP-Blue film by means of a photocopy machine.[3] The film image is then transferred to the blank PC board with a household iron set for silk or cotton. The film is peeled from the PC board and a durable etch-resist finish remains over the protected areas. The image placed on the PnP-Blue film must represent the component side of the board. A mirror-image reversal occurs when the pattern is photocopied onto the film. PCboards allows you to flip-flop the image before you print it, so it's no problem.

■ Etching Your Board

I use ferric-chloride etching solution from Radio Shack. A pint bottle will handle several small boards before depletion. Ammonium-persulphate crystals may be dissolved in water for use as an etchant.

Preheat the etching solution to approximately 90-100 degrees F before immersing the PC board. I use a Pyrex dish for etching. Preheating is done in the microwave oven.

WARNING: *Avoid direct contact with etching solutions. Wash affected areas immediately after coming in contact with the fluid. Don't breathe the fumes.*

Etching should require no more than 30 minutes. Agitate the PC board every two or three minutes to remove accumulated copper oxide residue. Thoroughly wash and dry the completed board. The black PnP etch-resist coating can be removed easily with standard paint solvent. Wash the board again after removing the etch-resist coating.

Component holes may be drilled with a no. 58, 59 or 60 bit. A no. 60 bit is standard for most components. Larger holes are required for 1-watt and larger resistors, and for some other parts. Carbide drills are best because they remain sharp longer when drilling fiberglass boards.

■ Final Comments

If you never made a PC board you've missed a feeling of accomplishment. Homemade boards are substantially cheaper than boards offered by vendors, especially if you can obtain bargain-priced PC-board stock at a flea market.

■ Notes

1 — Software is available on a 3-1/2 inch diskette from PCboards, 2110 14th Ave., Birmingham, AL 35205. Price: $99. Autorouting software also available from this vendor.

2 — Hosfelt Electronics, Inc., 2700 Sunset Blvd., Steubenville, OH 43952-1158. Phone: (800) 542-5414 for catalog or to order.

3 — Available from All Electronics Corp., 14928 Oxnard Street, Van Nuys, CA 91411. Phone: (800) 826-5432 for catalog or to order.

Jean Baker, KIN9DD

Collision Avoidance

Hello, and welcome aboard, everyone! This month we take a look at a new airline and profile the anti-collision warning device called the "T-CAS."

Jokingly referred to as the "fish finder" by many airline pilots, the traffic alert and collision avoidance system (TCAS II) is a system used for detecting and tracking aircraft. By interrogating the transponders of other planes in the vicinity, it analyzes the replies to determine range, bearing, distance, and (if reporting altitude) the relative altitude of the intruding aircraft.

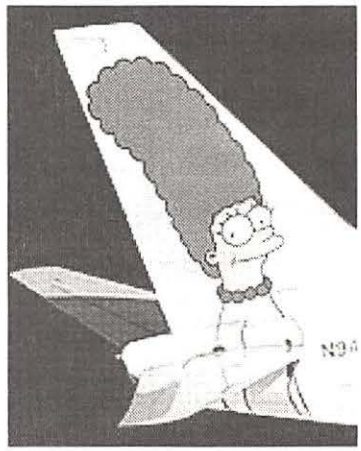
Should the TCAS II processor determine that a possible collision hazard exists, it issues visual and auditory advisories to the aircraft's crew for appropriate vertical maneuvers. However, the TCAS is of course unable to detect any intruding aircraft that doesn't have an operating transponder!

There are two types of cockpit displays for TCAS II: the resolution advisory (RA) display and the traffic advisory (TA) display. The RA is incorporated into the vertical speed indicator (VSI). By illuminating red and greens arcs around the dial, it displays the rate or the limitation of climb or descent required to avoid a possible collision.

The TA display shows an intruding aircraft's relative position and altitude with a trend arrow to indicate if it is climbing or descending at greater than 500 feet per minute. This TA display may be provided on the weather radar indicator or on a dedicated TCAS display. The display identifies the relative threat of each intruder by using various symbols and colors. Complementing the displays, TCAS II provides appropriate synthesized voice announcements.

The system calculates the appropriate vertical evasive maneuver and coordinates maneuvers of two or more TCAS II-equipped aircraft via Mode S transponder communication.

TCAS II will display four different traffic symbols on the traffic advisory displays. The symbols change shape and color to represent increasing levels of urgency. The traffic symbols may also have an associated altitude tag which shows relative altitude in hundreds of feet, indicating whether an intruder is climbing, flying level, or descending. A plus (+) sign and number above the symbol means the intruder is above your present altitude. A minus (-) sign and number beneath it indicates it is below your altitude. A trend arrow appears when the intruder's vertical rate is 500 feet per minute or greater. If an intruder is non-altitude reporting (NAR), the traffic symbol appears without an altitude or trend arrow.



The type of symbol selected by TCAS II is based on the intruder's location and closing rate. If TCAS direction finding techniques fail to locate the azimuth of another aircraft, a "no bearing" message appears on the screen.

Air traffic control procedures and the "see and avoid" concept will continue to be the *primary* means of ensuring aircraft separation. However, with the ever-increasing flow of traffic, the incorporation of TCAS II in transport category aircraft adds a significant back-up for collision avoidance.

Flying the Western Pacific

What's red, yellow, orange, green, blue, purple, sometimes a combination of these colors, and flies? Why, it's Western Pacific Airlines and their flying billboard paint schemes! Not since the original Braniff Airlines with their fleet of brilliant colors has there been a scheduled airline whose equipment so resembled a rainbow.

During its first eight months of operation (April of 1995 through December of that same year), Western Pacific flew more than 550,000 passengers, kept costs down to 6.6 cents per available seat mile; in August of 1995 it accomplished an astonishing load factor of 76 percent against the United States national average of 67 percent. Early in its history, the new carrier decided to specialize in low fare, nonstop, medium-haul services out of Colorado Springs, Colorado, with a one-type aircraft fleet: the 737-300. Founder and president of the airline, Ed Beauvis, claims it's "the best airplane ever built!"

Seating is provided for 138 passengers in an all-economy six abreast configuration. The airline uses an electronic ticketless system where passengers pay at the point of reservation and board in order of their allocated pass numbers, so those first on board sit where they choose.

Only snacks and drinks make up the in-flight food service. However, there's no sense of penny-pinching on board, as trips are enlivened by games organized by the flight attendants. Some of these games have included unraveling toilet paper rolls down both sides of the aisle without breaking the paper, and guessing the combined weight of the flight crew. During the fall of 1995, Western Pacific had no trouble persuading more than 5000 people to spend a fare of $59 on "mystery flights."

The airline's thirteen aircraft in the Air Logo Program, decorated with flying billboard paint schemes, are dubbed "LogoJets." No two airliners in the LogoJets fleet of 13 carry the same paintwork, and Western Pacific sells the fuselage space to corporations, hotels, colleges—in fact, to any organization willing to part with $100,000 repainting/rental fees. Fox's Television logo adorned the engine nacelles on #N49WP; the livery decorating the fuselage was Fox's *The Simpsons*!

Western Pacific sounds to this writer like a fun airline to fly; when I do, you'll read about it here in *Plane Talk*!

Contest Winner

Only *one* person came up with most of the correct answers for the contest we held in September of last year: Bob Burdick of Connecticut was the lucky guy, and he will receive a beautiful airline photo album for his efforts. For your future reference, here are the correct answers: 1-Major World Air Route Area, 2-On an ILS-equipped runway, 3-The "Fish Finder," 4-False, 5-Tracon, ARTCC, and Automated Flight Service Stations.

Incidentally, Bob not only got most of the answers right, but he also became the father of a bouncing baby boy in October, just before the October Grove Expo! Congratulations on both prizes, Bob!

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PC card shown here. Above is the simulated radio panel appearing on your computer screen!

**See September and October, 1996,* Monitoring Times *for full review. Reprint $4.*

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Winter Frequencies

For those of us that like to rough it outside in the snow, the thought of going off to a distant location to enjoy the wonders of nature is warmth enough. So to wind up the winter months, I thought I would continue with some more frequencies of The Great Oudoors.

Rarely do we hear from the State of Idaho, so I was twice as pleased when we received some mail from Idaho and it was accompanied by some of the frequencies used by the National Forest Service. Here is an abbreviated list of the frequencies sent in by our correspondent.

National Forest Service

Frequency	Use
133.6750	Helicopter coordination
135.3750	Air attack support
166.0250	Command repeater out-channel 7/Air operations net repeater out
166.6125	Command repeater out-channel 5
166.7250	TAC-1
166.7750	TAC-2
168.2500	TAC-3
168.4000	Command repeater above input
170.2250	Command/Air operations repeater above input
171.0250	Helicopter deck
171.1000	Ground to air/medical helicopter
411.7500	Camp net

For Sale: Top Secret Radios

Recently, a friend—who obviously wishes to remain unidentified—attended a major amateur radio hamfest in the midwest (not Dayton). While there he spotted a new piece of Motorola two-way equipment (a walkie-talkie type unit) out on the table. The seller of this unit told my friend he did not know much about the unit but he thought it was an old piece of government gear. My friend—sly as a henhouse fox—played along with him and ended purchasing the equipment for a few cents on the dollar of the original price of the unit.

When my friend got home he confirmed what he had purchased. It was a practically brand-new Motorola 8-channel SyntorX-9000 with the logo "WHCA" stamped on it! For you new readers to my column, WHCA is the White House Communications Agency. They provide the Presidential and Secret Service Communications for the government. The radio was set up as follows:

Photo by Jennifer Baughn

"WHCA" Programmed Frequencies

Channel	Designator	Frequency
01	Delta	169.925
02	Sierra	166.5125
03	Charlie	165.375
04	Oscar	164.8875
05	Tango	164.650
06	Yankee/Zulu	171.2875TX/162.6875RX
07	Zulu/Yankee	162.6875TX/171.2875RX
08	Whiskey	167.075

DELTA	Marine Corps guard detail at Camp David and Anacosta Naval Air Station
SIERRA	White House command post nationwide
CHARLIE	Main repeater out nationwide
OSCAR	White House cabinet protection
TANGO	District offices tactical
YANKEE/ZULU	YANKEE is the heavily encrypted direct telephone from the ground units to Air Force 1. It is one/half of a duplex pair. The other half is the ZULU. It goes from Air Force 1 to ground units.
WHISKEY	This is the WHCA paging channel that carries a lot of "interesting" traffic. See my column a couple of issues ago on the Message Tracker system for complete details.

Did my friend find a wonderful piece of equipment? The answer is yes. Was it a once in a lifetime find? Probably not. Recently a number of trunked radios on the Military District of Washington were sold into the commercial arena at a local government auction. These radios were working radios already set up on working trunking fleets and subfleets for some of the big names in the Washington, D.C., area. They were all in the 406/420 MHz federal trunking band.

With a new year upon us, there will be numerous hamfests and flea markets to attend. Keep your eye out for like equipment. If you are not quite sure what you are looking for—take a knowledgable friend. Then maybe you will have the making of a small system.

More North Carolina and National Park Frequencies

I want to continue with my trip up into the mountains of the Eastern Seaboard and continue with some of the radio frequencies used in the North Carolina area. A source tells me that the FBI in Charlotte, North Carolina, is using several repeater pairs. The channel identified as "ALPHA 5" is 167.3875 out, with an input of 162.6375 MHz. An unidentified repeater uses the same input and simulcasts the above on 167.4125.

Two additional FBI repeater outputs have been found also. They have outputs of 167.4125 and 167.7875 MHz, radio callsign is KEV220. Generally all FBI callsigns begin with "KEV---". Radio technicians have been heard testing repeaters using identifiers of "Clingman" and "Linville." Clingman has to be Clingman's Dome—the highest piece of

land in the Great Smoky Mountain National Park—and Linville hosts a number of repeaters in the same area, near the popular attraction of Linville Falls.

Other frequencies that were monitored in that area were:

Charlotte, NC, Frequencies

Frequency	Use
163.2000	U.S. Marshal
165.2375	U.S. Customs
165.2875	Bureau of Alcohol, Tobacco, and Firearms
165.3750	Secret Service "Charlie" - Charlotte primary
165.7875	Secret Service - "Baker"
166.5375	ATF
166.5875	Secret Service (see footnote)
167.1750	Blue Ridge Parkway - Law Enforcement
414.7500	Postal Inspectors

NOTE: 166.5875 is often used by Customs and ATF. This interception was definitely Secret Service because of the subaudible tone presently used by the Secret Service (103.5 Hz).

Moving into the "Bluegrass State" of Kentucky, there are several National Parks and Monuments that have radio systems. The known ones are:

Kentucky National Parks

Frequency	Location and Use
xxxxxx	Abraham Lincoln Birthplace - no known radio system
166.3000	Cumberland Gap National Park - repeater input
166.7875	Cumberland Gap National Park - repeater out/simplex on property
169.5500	Mammoth Cave National Park - repeater out/simplex on property
170.1000	Mammoth Cave National Park - repeater input

South Carolina

Frequency	Location and Use
xxxxxx	Ninety-Six National Historic Site - no known radio system
166.8500	Congaree Swamp National Monument - repeater input
169.4000	Charles Pinckney National Historical Site - repeater input
169.4000	Fort Sumter National Monument - Repeater input
169.7750	Congaree Swamp National Monument - repeater out/simplex on property
170.0500	Charles Pinckney National Historical Site - repeater out/simplex on property
170.0500	Fort Sumter National Monument - repeater out/simplex on property
171.7750	Cowpens National Battlefield - simplex
172.4250	Cowpens radio alarms - King's Mountain
171.7750	Kings Mountain National Military Park - repeater out/simplex on property
172.4750	Kings Mountain National Military Park - repeater input

If snow doesn't warm your heart, you may be fleeing to the Caribbean this winter. If you get into the American territories of the Virgin Islands, here are a few of the following National Sites down there.

Virgin Island National Sites

Frequency	Location and Use
171.7250	Buck Island Reef - St. Croix - repeater out/simplex around island
171.7250	Christiansted National Historic Site - St. Croix - repeater out/simplex around island
171.7250	Virgin Island National Park - St. Thomas - repeater out/simplex around island
172.6250	Christiansted National Historic Site - repeater input
172.6250	Buck Island Reef - repeater input
172.6250	Virgin Island National Park - repeater input

■ Walk on the Wild Side

While you are in the National Park—whether you wish to encounter or to avoid nearby wildlife—you may find it educational to tune in the tracking and telemetry frequencies used by the Department of the Interior in the Southeast.

Dept of the Interior Tracking and Telemetry

Channel	Frequency	Use
01	164.4375	General Southeast USA tracking
02	164.4625	Cape Canaveral National Seashore turtles
03	164.4875	Cape Lookout turtles
04	164.5125	Cumberland Island turtles
05	164.5375	Great Smoky wildlife tracking
06	164.5625	Everglades alligator tracking
07	164.5875	Fort Jefferson wildlife
08	164.6125	Unassigned
09	164.6375	Unassigned
10	164.6625	Unassigned
11	164.6875	Unassigned
12	164.7125	Unassigned

■ Take it to the Grave

Here's a monitoring target I'll wager you never considered before. The National Cemetery System has cemeteries in almost every state of the Union. At the last count there were one hundred and five cemeteries. Some of them even have radio systems. Here are the known systems and their frequencies:

Cemetery Frequencies

Frequency	Name	City, State
163.3750	Jefferson Barricks	St. Louis, MO
164.1000	Fort Sam Houston	San Antonio, TX
164.1750	Riverside National Cemetery	Riverside, CA
164.1750	Wood Nat'l Cemetery (Paging)	Milwaukee, WI
165.1875	WAR330--ARMY	Arlington, VA
166.2000	Dayton National Cemetery	Dayton, OH
166.2250	Mtn Home Nat'l Cemetery	Mountain Home, TN
168.5250	Chattanooga Nat'l Cemetery	Chattanooga, TN
168.5250	Fayetville National Cemetery	Fayetville, AR
168.5250	Massachusetts Nat'l Cemetery	Bourne, MA
168.5250	National Memorial	Honolulu, HI
168.5250	Wood National	Milwaukee, WI
168.5750	Atlington National Cemetery	Arlington, VA
170.0000	Golden Gate National Cemetery	San Bruno, CA
171.3875	Ft. Rosecrans	San Diego, CA
409.3250	Itinerant Operations	Nationwide US
409.4000	Itinerant Operations	Nationwide US
414.3250	Itinerant Operations	Nationwide US
419.1500	Los Angeles National Cemetery	Los Angeles, CA

Ken Reitz, KS4ZR

The State of C-band, Ku-band, and DBS

1996 was a year of huge changes in the satellite entertainment industry. DBS continued to expand with widespread popularity. C-band (3.7-4.2 GHz) continued in uncertain stagnation while the Ku-band (11.7-12.2 GHz) quietly continued to be the band of action most ignored. Many of the questions raised in the past year are finally being answered. So, let's have those questions and get some answers!

Q: Who's winning the DBS sweepstakes and what's ahead for DBS?

A: Statistically, DSS (DirecTV and USSB) are wining the DBS sweepstakes—the race to see who can rack up the most subscribers and, hopefully, drive opponents into bankruptcy. By the time you read this, DSS subscriptions could equal that of the VCII C-band market. Both have 2.3 million subscribers and account for about 70 percent of the total satellite TV market. Primestar continues to garner widespread support and has about 1.6 million viewers, or about 25 percent of the market.

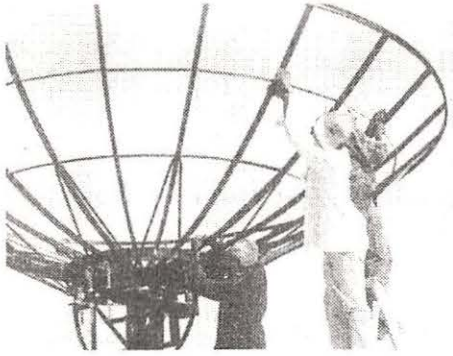
Echostar's DISH network had a late start and is making up ground but has a long way to go. Currently, they have just over 250,000 subscribers and are adding customers at a rate of nearly 40,000 per month. Lagging woefully behind with difficulty in distribution and advertising, Alphastar has fewer than 15,000 subscribers and is said to be adding viewers at 250 per day. That adds up to a fraction of DISH, the next smallest DBS service.

Primestar will see continued increases in subscribers as they migrate to the new GE-2—a satellite which should be operational as you read this—from K-1, an older and lower powered Ku-band bird. GE-2 will have the same location as K-1 (85 degrees West), and Primestar customers will not notice the switchover. The C-band side of Ku will be mostly transponders leased by the Federal government. Best news here is that NASA TV will migrate from its long-time post on Spacenet 2, providing excellent coverage for those on the West Coast who have struggled with NASA TV's Clarke Belt position.

Expect no new developments with satellites and hardware for DirecTV, USSB, or DISH; their satellites are all in place and they're concentrating on adding and improving programming services. Now, if they could just get the prices down...

Q: C-band is dead, isn't it?

A: Don't try to tell that to the C-band programming industry who are happily banking over half a billion dollars a year from C-band customers, who are creeping ahead at a rate to rival only Alphastar. Too, there's the less seen figure of all the C-band dish owners who don't subscribe to anything, but who enjoy watching the 100 or so free-and-in-the-clear channels. How many of them are there and at what rate are they growing? No one seems to be keeping track of that—after all, with no subscription fee there's no profit in finding out.



A crew being trained to install an Orbitron 016 C-band dish.

In spite of the doom and gloom from various disgruntled satellite TV dealers, C-band continues to offer the widest range of programming and the cheapest per-channel rate of any TV service. In addition to the ever-increasing cable channel fare, C-band is the place for syndicated program feeds, sports backhauls, news feeds, international programming, adult channels, and channels specifically targeting the C-band audience. In addition, there are the large number of audio subcarrier services, Single Channel Per Carrier (SCPC) services, and the odd data and internet service.

And finally, there are the new channels. New cable-TV channels such as ESPNEWS Net, SpeedVision, Nick at Nite's TV Land, and many others debut on the C-band, and C-band viewers are the first to see these offerings for free. The reason for this is that C-band is how programming is downlinked to all the terrestrial cable systems in the country. If it's going to be on cable-TV, it's going to be on C-band first. That's also why so many of the cable-related channels are on satellites in the so-called "cable neighborhood"—the satellites between 137 degrees (Satcom C1) and 123 degrees (Galaxy 9).

Q: O.K., since it's still alive and kicking, what's new in C-band?

A: Plenty. For starters, there are quite a few new satellites. A year ago folks in the industry were wringing their hands about the C-band transponder crunch, but the addition of a couple of higher powered new satellites has taken care of that problem. There have even been billboards on some new satellite channels advertising their vacancies, a sight not seen in several years. Currently there are more than 20 operational C-band satellites with a total of over 400 channels of video and/or audio services.

It's true that a number of cable TV channels are switching to General Instrument's Digicipher II format, but there will be a Digicipher II receiver on the market some time this year. This means C-band viewers will be given even more options, both now and in the future.

Also, the introduction of DBS LNBFs allow C-band viewers to subscribe to DBS services and keep their C-band dish for the wild feeds, international satellites, news and sports backhauls. These new devices (which will be reviewed in next month's column) could have an impact on C-band trends. Retrofit DBS feeds for old C-band dishes; DBS, C/Ku-band feeds for newcomers to satellite TV, and add-on DBS feeds for veteran satellite viewers should add to the options available.

Q: So, whatever happened to Ku-band?

A: I'm always amazed at how little the Ku-band is mentioned either by dealers or con-

USSB sumers. Virtually all satellite receivers on the market today are Ku-band compatible, which is to say that there is a separate jack for a Ku-band feed and switching is done via the remote control. Therefore, the cost of adding Ku-band to your current system is the difference between a regular feed and a C/Ku-band feed plus the addition of the Ku-band LNB (and, of course, the extra length of RG/6 coax from the feed horn to your receiver). While these are not insignificant costs, it shouldn't total more than $150 to add Ku to your system.

While there are only six Ku-band satellites with active transponders receivable across most of the country, these satellites feature some of the more interesting viewing available to the home market, and they are totally unavailable on anyone's DBS. Because of its smaller transmitting dish, it's most often used for news and sports backhauls. When the conventions were going on last summer, the Ku birds were jammed with uplinks. In the thick of the sports season, Ku is the place for college and professional basketball and hockey and college football. In addition, NBC has a number of feeds on its new GE-1 location with a beautifully clear signal.

Ku is the place for international broadcasters such as Russian television, broadcasts direct from China, ITN World News from England, Canadian TV fare, as well as the site for many educational and industry feeds. With little in the way of scheduled programming, Ku most closely resembles the good old days of C-band when nothing was scrambled and channels could light up at any time.

There is very little in the way of audio subcarriers on Ku, compared to the activity on C-band. The main reason is that audio subcarriers are intended for cable distribution and hence they reside on C-band. With Ku primarily devoted to network and backhaul operations there has been no history of Ku band audio. There are some notable exceptions, such as DZMM, an AM outlet from Manila on G4, 24 (Ku) 6.80 MHz or Sangeet Sagar, multilingual music from India on Anik E2, 16 (Ku) 6.12 MHz.

The future of Ku should be a good one. The latest satellites are not only C/Ku-band but the Ku side is quite powerful, making the use of much smaller dishes possible. A six foot C/Ku-band dish should give excellent results. If you like to watch sports and satellite news gathering (SNG) operations in action, Ku is the place for you.

Q: Does this mean it's a good time to buy a C-band system?

A: Absolutely. Greater bargains in new C-band equipment couldn't be found. Many manufacturers, exiting the C-band business in favor of the quick buck in DBS, are dumping brand new receivers in factory-sealed cartons at shocking prices. Only America's R. L. Drake company, steadfastly standing by its position in the industry, is failing to panic. Their top grade receivers are still commanding top prices. And why not? With new C/Ku satellites being launched this year, C-band will have at least 15 more years of service.

It's ironic that C-band technology has finally evolved to the point that the equipment is easier to set up and maintain, that the systems are technologically superior, and reception has never been better. Still, there's a case for a slight resurgence in C-band sales as dealers see less and less in the way of DBS profits and begin to once again push C-band systems. Consumers, tired of the same high monthly bills they thought they were escaping from Cable-TV, might give C-band a second (or first) look.

■ Mailbag

Kenneth Farmer of Blue Ridge, Georgia, wants to know "...if AlphaStar is selling only to certain parts of the country at this time? I have seen no ads for AlphaStar in the many magazines I read. I do not know how people are supposed to find out about them. How are they marketing their product to the public?..."

AlphaStar, much to its chagrin, has become a textbook case of how not to launch a DBS service. At a time in which DBS would seem a license to print money, AlphaStar has somehow gummed up their own printing press.

DIRECTV.

Launched last July, the service seemed, on paper, the very equal to DirecTV, USSB, and DISH. Yet, ten months later they have garnered just 12,000 subscribers. Originally, AlphaStar was to have been distributed by the vast and well-seasoned sales force of the Amway machine. However, late last summer Amway pulled out of the deal and left AlphaStar without distribution and therefore advertising as well. While it has been nearly impossible to escape the advertising bombardment from DSS and DISH, AlphaStar has been strangely silent.

It should be clear that, in the DBS industry, a shake-out is inevitable. The hardware price war precipitated last summer by DISH, and joined immediately by DSS, has cut deeply into corporate profits by all participants in an effort to pull in subscribers. And, in the end, it's subscriptions which are driving the DBS industry, unlike the C-band satellite TV industry, which was originally driven by hardware profits. AlphaStar transmits its digital programming on Ku transponders leased on Telstar 402R. Repeated attempts to contact an AlphaStar spokesman on this issue have gone unanswered.

DBS companies, courtesy of *Satellite Times* magazine:

Alphastar Digital Television, 208 Harbor Drive, Building One, First Floor, Stamford, CT 06904. Telephone: (203) 359-8077. Web site: **http://www.teecomm.com**

DirecTV, 2230 East Imperial Highway, El Segundo, Calif. 90245, 1-800-DIRECTV (347-3288), Web site: **http://www.directv.com**

Echostar DISH Network, 90 Inverness Circle East, Englewood, CO 80112, Telephone: (303) 799-8222, Fax: (303) 799-3632. Web Site: **http://www.echostar.com**

ExpressVu Inc, 1290 Central Parkway West, Suite 1008, Mississauga, ON L5C 4R3, Telephone 1-800-339-6908 in Canada. Web Site: **http://www.expressvu.com**

Primestar Partners, 3 Bala Plaza West, Suite 700, Bala Cynwyd, PA 19004, 1-800-966-9615

USSB, 3415 University Avenue, St. Paul, Minn. 55114, 1-800-204-USSB (8772)

Channels listings for all the DBS companies listed above can be found in each issue of *Satellite Times* magazine.

Bill Cheek
Internet: bcheek@cts.com

Tools for the Information Age

Psssst, hey buddy; do you feel like the world left you eating dust in its back trail or like a gallon jug filled with five gallons of tomato juice? These are symptoms of information overload that will become more and more prevalent (like carpal tunnel syndrome) with the coming of the Information Age. New technology always creates new problems. Information overload is a big one. (*PC Magazine*, Dec-17, 1996, John C. Dvorak)

The Information Age removes many of the natural barriers between us and the boatloads of information that we'd never otherwise encounter. Like carpal tunnel syndrome, the best cure is prevention, and I have a tip for you if info-bloat makes you feel like a hot-air balloon.

FIGURE 1: FCC DATABASE FIELDS

FREQUENCY	XMIT_HAAT	ERP_UNITS
CALLSIGN	XMIT_EFF	POWER_OUT
RADIO_SERV	XMIT_STRUH	PO_UNITS
DBA_NAME	CLASS_STAT	EMISSIONS
LIC_STATE	TYPE_MS	ISSUE_DATE
LIC_ZIP	AREA_OPER	EXPIR_DATE
LIC_CITY	RADIUS_OP	OPER_BEGIN
LIC_ADDR	ANT_TYPE	OPER_END
LICENSEE	ELEV_ANGLE	NR_MOB_VEH
XMIT_LAT	AZIMUTH	NR_MOB_PRT
XMIT_LONG	POLARIZATN	NR_MOB_AIR
XMIT_STATE	GAIN	NR_MOB_MAR
XMIT_COUNT	PATH_LEN	NR_MOB_PAG
XMIT_CITY	BEAM_WIDTH	APPL_PHONE
XMIT_ADDR	ERP	FREQ_HIGH
XMIT_ELEV	PO_IND	DB_ID
XMIT_HGHT	ERP_IND	FSN

It's the Tools

The tools spell the difference for the Information Age. The better you can use them, the more at home you'll feel. Armed with the right tools, you'll find your rightful spot in the fast lanes of the Information Highway, and still be a homebody, family person, or whatever your natural niche.

Unless you're a computer jockey with a sideline hobby of radio, it's not likely you want to spend much time messing with computers and software to "make things work." You probably want to turn the darned thing on and generate or process information and get back to playing radio, right? If so, there's a well kept secret around radio-land that offers a lot of bang for the buck: Microsoft WORKS for Windows in versions for Windows 3.1 and Windows 95 (and maybe even still a version for MS-DOS).

I know, I know ... I've mentioned MS-WORKS before, but no one sounded off to agree or disagree, so I assume I wasn't heard. Read my lips: MS Works offers a highly integrated trio of word processor, database, and spreadsheet for about $79. Works is so powerful that many small businesses use it. MS Works can support your family's information needs, as well as your own voluminous appetite for radio lore.

Information Methods

In the olden days, (like a few years ago), we set up shelves of books, file drawers with manila folders, index card systems, and a few boxes to hold favored periodical literature (like *MT*). It took time to manage and use, but a major advantage was that we remembered the general contents of each location. Access was easy.

Now we are overwhelmed with ten times more information, most of which is "virtual" that comes in by computer and modem from some distant, exotic treasure trove of arcane lore. Oh, it's good stuff, all right, but virtual information differs from tangible information in how it's handled, stored, and processed. The old ways are still just fine with new tools, but it's a major problem to switch overnight.

Not everyone can switch without a fight. Some people just bail out and take up knitting; others get serious and try to absorb everything at once. Both extremes cause unique pain and it only gets worse.

More Organization

One solution is to be persnickety and meticulous about information and how it is acquired, organized, and stored. Make yourself take time. Even though your tools and methods change—often daily—don't expect your mind to keep pace. Do your own thinking as you always have in the way that's most comfortable, but guide it to learning new technologies at a steady, pleasant pace.

And understand one simple concept: there is no limit to the amount of information that can be acquired, processed, and stored, but there is a limit to how much of it can be converted into knowledge. Knowledge comes after information has been applied or used, and that takes time. It ain't how much ya got, Bunky; it's how how well you do with what ya got. Remember that and take the time to master a few tools.

Tools for the Information Age

A database manager is one of the most potent tools for processing and storing information, especially about radio frequencies. A database is generally more powerful for this kind of information because much more information can be stored and systematically retrieved than from a word processor or spreadsheet.

Enter the database manager, represented here by the simple flat-file manager in Microsoft Works. One of your keenest interests might well be a frequency/license database of the type issued by the FCC. See Figure 1 for an overview of the many categories or "fields" of information the FCC keeps for each licensee. You'd be overwhelmed to track this amount of information on paper for even a few frequencies. A few million would knock your socks off right quick.

Even if you shortened the information per

FIGURE 2: MS-WORKS DATABASE

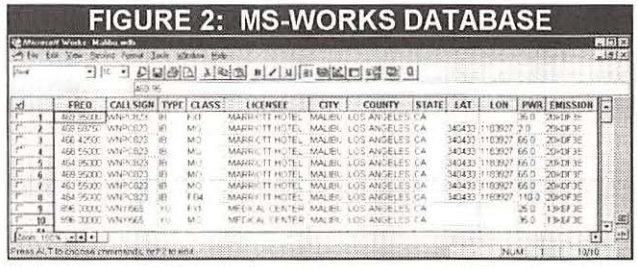
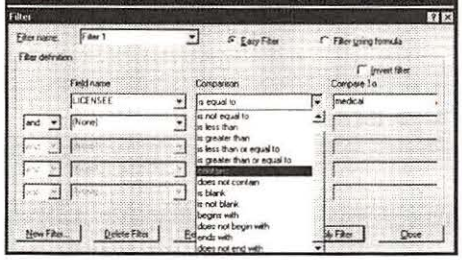


FIGURE 3: MS-WORKS EASY QUERY BUILDER



record to a few essential columns or fields like I did in Figure 2, the sheer volume of several thousand records will still blow you away without a powerful system for the legwork. MS-Works is one such system. Figure 2 is a simplified database of Figure 1 created in seconds with MS-Works. Ten records and twelve fields are shown, but there could just as easily be thousands.

The Mechanics of a Database

A database is a table of information. A database manager is the program that sets up, organizes, and presents the database in a manner you want to see or use. A table has columns and rows. Each row is a record, and each column is a specific type of information for each record. Again, see Figure 2 to make this idea clear for a frequency database. Figure 2 is the database, while MS Works is the database manager. A telephone book is an example of a good paper database: LAST : FIRST : ADDRESS : CITY : PHONE

Get the idea? Tables of information are as old as the hills, and to this day, there is no better way to systematically store and preserve data than in an old fashioned table.

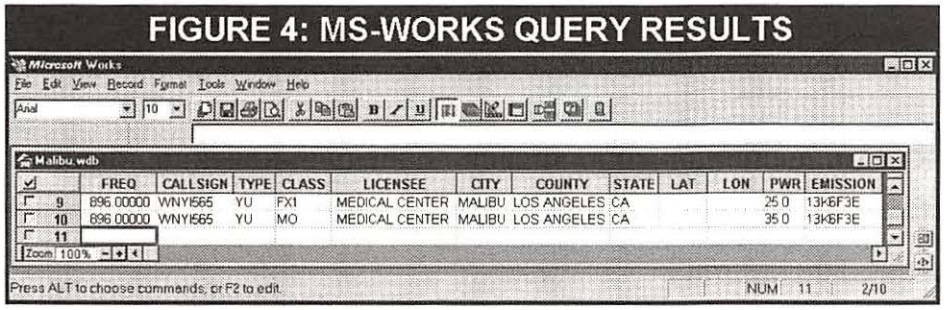
The Differences

For starters, try to look up a specific phone number in a regular directory *without* a last name. Got a couple of months?! A database manager is not limited to one key like a printed directory. Any column in a database can be keyed by a computer for lightning-quick lookups and selective presentation of data. For example, Figure 2 comes from my Microsoft ACCESS California database of 365,000 records. Don't even think I mess with that puppy! I used the query function in ACCESS to acquire all data with "Malibu" in the LICENSEE field. Then I plopped that small block of data into MS-Works' database; edited the "Malibu" out of the LICENSEE field; and deleted about forty of the other fields in order to make the simplified example. This work was done in seconds.

Queries and Sorts

Now imagine Figure 2 to be much larger than shown, say thousands of records, and suppose we want to see all records with the word "medical" in the LICENSEE field. MS-Works makes it a no-brainer to prepare a "filter" (query) as shown in Figure 3. A couple of mouse clicks, first on Tools, followed by Filter, presents the screen in Figure 3. Click in the Field box and select LICENSEE; then click in the Comparison box and choose *contains*. Lastly, type "medical" in the Compare To box and click Apply Filter. Presto-magico, Works quickly returns the screen shown in Figure 4.

FIGURE 4: MS-WORKS QUERY RESULTS



You don't have to let your imagination run amok to see where hundreds of combinations of data searches or queries can be performed with MS-Works' Filter function. Not only can AND and OR logic be used, but up to five fields can be specified in the criteria by which the data is selected. You can't find a needle in a haystack, but a database manager can!

Another powerful database tool is the sort function where any column can be arranged alphabetically or numerically, in ascending or descending order. One minute you can sort by FREQuency, and the next, by LICENSEE. Queries or filters and sorts can make sense out of a mountain of data ... fast!

Summary

This has been an exploratory probe into database power. From what I can tell, not many radio hobbyists are up to speed in state-of-the-art information handling, so we can go a lot farther with this topic, if you like. Please let me know. Next month, we'll use a spreadsheet to design an electronic circuit. From there, it's your call. We aim to please! You aim, too, please!

E-mail: bcheek@cts.com
WWW: http://ourworld.compuserve.com/homepages/bcheek
FTP: ftp://ftp.cts.com/pub/bcheek
BBS & FAX: (619) 578-9247 5:30pm-1:30pm, PDT

John Catalano, PhD
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DXtreme's SWL Log Program

Apologies if you came looking for a recap of decoder programs as promised last month. The amount of new material dictates we move forward in '97 instead of looking back. If you have specific questions on decoders we have reviewed, feel free to write or e-mail me on them.

This month we will cover a wide range of topics: a first-hand look at an inexpensive SWL logging program from DXtreme Software; questions and comments from readers' E-mail; and some very useful and interesting monitoring-related Web sites. It's a lot to cover, so let's get moving...

Taking it to the DXtreme

With all the new commercial and shareware programs that are on the market or being introduced each week, it's hard to single one out of the pack as a "find." At $19.95 ShortWave Reception Log, SWRL version 1.0, by DXtreme Software, is just such a program. Its function is simple: SWRL is a paperless log made specifically for shortwave listeners. SWRL, which works under Windows 95 or 3.1, has the following minimum hardware requirements: a 486SX, four megabytes of random access memory (RAM), video graphics adapter (VGA), and two megabytes of hard drive space. SWRL provides the user with three main functions: creating a master log of stations monitored, creating reception reports and, finally, a summary of results by countries heard, QSLs verified, and unverified.

Most of the action takes place on the reception log screen (figure 1). All the data that you would write on a piece of paper is entered on this screen. Your monitoring station data is only entered once. Similarly, entering broadcast station data is kept to a minimum. A report can be generated using Microsoft Word or (for Win 95 users) WordPad. If you don't have Word version 6.0 or greater than Windows version 3.1, you can use Microsoft Write to produce reception reports.

Is it as easy to use as paper? Pretty close. Maybe even better. The summary report window I found very useful for getting a snapshot of my SWL results. But remember, SWRL does not send or receive data to/from your radio. Therefore, using SWRL requires manual tuning, and retuning, of your receiver. This is in contrast to programs such as SWL Manager which includes receiver control software capabilities. But, at $19.95, and strictly as a replacement for a paper log, SWRL will not disappoint you.

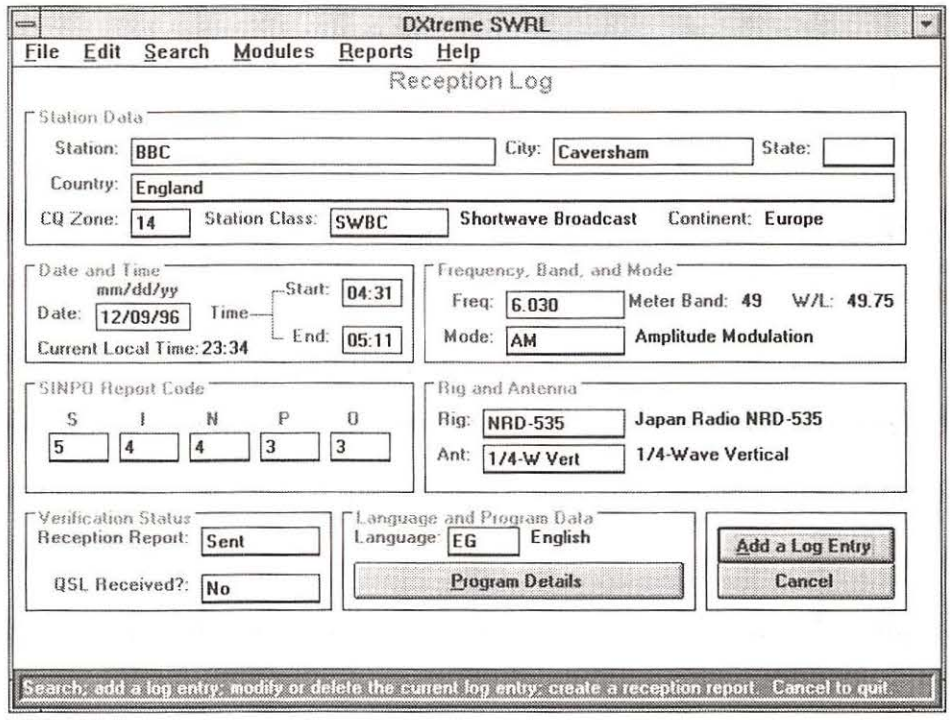


FIGURE 1

Short Wave Reception Log, SWRL, is available from DXtreme Software, 26 Langholm Drive, Nashua, NH 03062. Check their Web address in the *Computers and Radio* links table.

Keep those E-Mails Coming!

Although most people have recently discovered E-Mail, I assure you it is not a new concept. In the mid 1980's when I was managing a business division for a major international electronics company, we had E-Mail. Oh boy, did we have E-Mail! It got so misused that by 1987 I had to hire another secretary just to sort through my 200+ daily E-Mails to find the important ones which required action. It brought a whole meaning to "junk mail." But, I am happy to say the readers who have sent me E-Mail via *MT* have been a real pleasure. So let's look at a few of the latest.

Dave Wentzel asks whether you can use the excellent shareware program, Hamcomm, to decode ACARS. Not to my knowledge, Dave, but it sure sounds like a good idea. I'd certainly like to hear from the authors of Hamcomm if they have any plans for expansion in the number of modes it will decode.

Dave also talks about the automatic packet reporting system (APRS). This is a pretty nifty amateur radio system requiring a computer, radio transceiver, tnc (such as PK-232), and a GPS (global positioning satellite) receiver. The output of APRS is a map with the exact location of the sending station marked on it. If the station is portable, the mark will move on the map in sync with the station's movement.

I spoke with AEA over nine months ago regarding APRS, which is now included in the new firmware for the PK-232MBX as well as their newer DSP-based decoders. Dave writes, "... the latest version of APRS decodes ACARS (if the terminal node controller or TNC is ACARS capable) and displays the location of the ACARS-sending aircraft on a map."

That one I would like to see, Dave. Unfortunately, AEA is in the process of being sold, and just what will happen to products and support won't be clear until early this spring. Stay tuned to *MT* for more as we find out.

WEB SITE	ADDRESS www.+	COMMENTS
DXtreme	qth.com/dxtreme	SWL Log Demo
Ziff-Davis Publish	zdnet.com	Shareware & more
Radio Manager	interplaza.com/scandfw/	Scanner Info; Dallas TX Info
Ham Call Lookup	ualr.edu/~hamradio/	callsign.htmlHam Database
Switchboard	switchboard.com	Database Business & Individuals
Broadcast Net Hotlinx	broadcast.net/blinx.html	Lots of Radio/TV Links

FIGURE 2

More Gold To Mine

With some surprise I read an E-Mail from Bob Grove in which he credits Chanel, a support technician at Grove, with finding a radio-related Web site, **www.zdnet.com**. I mean, does Macy's give travel directions to WalMart? I checked it out, and sure enough it was very good.

In the Home and Hobby section you will find some useful shareware monitoring programs, and that is just a very small portion of what is available on a wide variety of subjects. This is definitely worth a look. "Who is zdnet?" you may ask. The answer is Ziff-Davis publishers—one of the largest magazine publishers in the world. Thanks to Grove Publishing for their open-mindedness and that home page lead.

Another member of our Grove team, esteemed *MT* editor Rachel Baughn, passed along E-Mail concerning live Internet broadcasts by Global Radio Milano. Check their home page listed in Figure 2 for the latest details.

From our request to readers for their interesting radio-related Web sites, comes one from Ben Saladino, KC5IRJ, who is the author of Radio Manager for Windows. He passed along his Web site that will be of interest to scanner enthusiasts in the Dallas/Fort Worth area. Also included is a discussion for choosing the right scanner and antenna. You can even download a shareware version of Radio Manager for Windows.

KF4CYB, Ron, has sent us a number of very useful links. To find Ron's surname, you can use one of his recommended links at the University of Arkansas, which puts names to ham calls. Another link he provided, Switchboard, is very useful in finding the address and telephone number of most individuals and businesses. It's just like those "We'll find anyone, anywhere for $59.99" TV ads. Thanks to both Ron and Rachel for sharing these links.

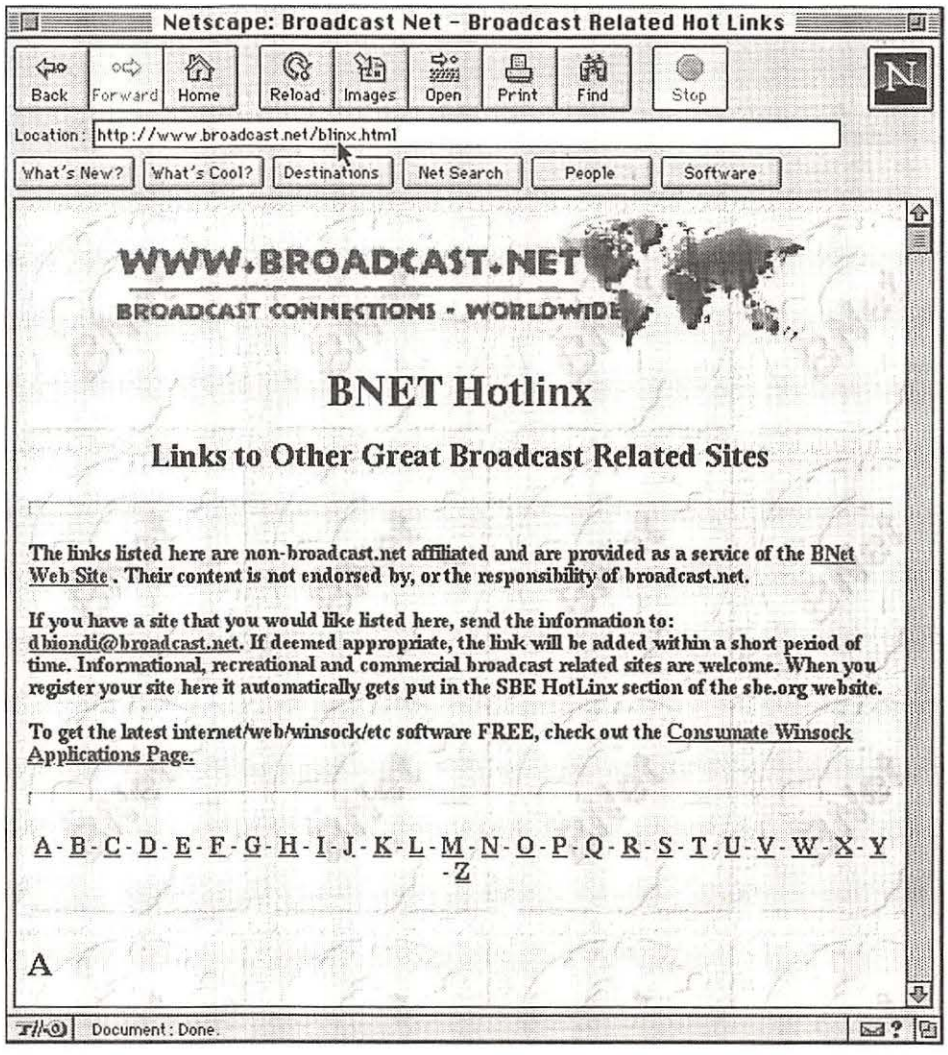
All links mentioned in the column are included in a *Computers and Radio* links table, and will also be placed on the *MT* web site for a limited time. Watch for this regular feature of this column. How about sharing your golden links with your monitoring brethren? Send recommended sites to this column at the E-mail address in the header above.

A Link for All Seasons

Our final Internet page of mention this month is from Broadcast Net. This Web site in Figure 3 has a very comprehensive links page, BNET Hotlinx, with lots of links to sites having to do with TV or radio broadcasting. For example, sites having old 1940's radio program recordings available for downloading are listed here. Professional equipment manufacturers, satellite communications companies, and even NASA are links found here. ... Hey! Why is *MT* listed under the "S" category? Well, it's a great Web site to check, even though *MT* takes a back seat to *Satellite Times*.

Till next time, when we'll look at CAT's Web page and one of their new products, stay warm and focus on an early spring.

FIGURE 3



Trends in QSLing

By Arthur Cushen

There seems to be a worldwide concern that the replies received to reception reports from mediumwave and shortwave stations are on the decline. I decided to take a survey based on the verifications I have received from medium and shortwave stations over the past 56 years to see if this proves true from experience. It may surprise many readers to learn that the returns have been fairly consistent over the years, and that, on average, 60 percent of stations verify reception reports.

Arthur Cushen reading from a Braille strip at Radio New Zealand studios for his first broadcast on Radio Nederland's **DX Juke Box**, *which continues today on* **Media Network.**

Current Trends

These days listeners are aware of the varying policies of international broadcasters toward verifying reception reports. In particular, those hobbyists seeking verification from overseas domestic shortwave stations or from local stations complain at the lack of returns for the reports they have submitted. It is partly for this reason I decided to look back to 1939 to compare the percentage of replies received on reports to both AM and shortwave signals.

Two factors one has to take into consideration when requesting a verification are budget cuts and the general policy of the station concerning reception reports. There are those stations which refuse to reply to mail on the grounds that they have had a budget cut, or that they already have overseas monitors (and therefore do not need the information provided by the reception report), or that they do not have the staff to handle incoming mail.

Ian McFarland and Arthur Cushen (right) at the 1986 ANARC Convention in Montreal, Canada.

There is another group of stations which spasmodically verify reports, depending upon the feelings of the staff and whether they wish to take the trouble to acknowledge reception of their signals. Or, there is also the group which confirms reception with a type of acknowledgment card, such as a QSL card or postcard, but supplies none of the details sought by the listener, such as frequency, programming, transmission site, etc.

The final group is the one most appreciated by listeners—those which offer a fully detailed verification, stickers, pennants, schedules, and the like, and which make full use of audience participation.

A Hobby of Ups and Downs

To set the background for this survey, you should understand that I am not one who continually sends a copy of report to a station after the first one has not been verified in an attempt to get a reply. If my second follow-up does not result in a verification, then I do not pursue the matter further, but will log the station again if possible at a later date. I generally send IRCs to smaller broadcasting stations, at times I send U.S. dollars or stamps, and reports to Latin American stations are written in Spanish.

Looking at the results over this long period of listening, we find that by far the most successful year was 1939, in which 309 reports were sent, resulting in 269 verifications, or some 87 percent. On the other hand, I did not calculate the verifications during the war years at all.

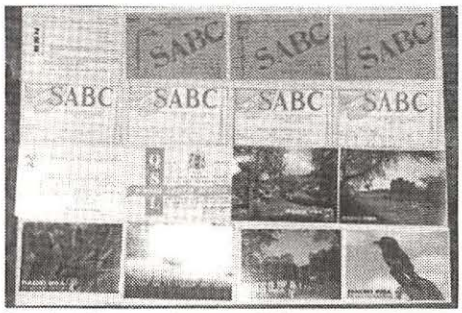
As World War II raged across Europe, Asia, and the South Pacific, my listening was restricted to the Middle East, India, Africa, North and South America, and Australia. Even gathering enough details of verifiable material from stations was a problem, due to the fact that no weather reports were given and other than the commercials, and basic information was at an all-time low. Even if a report were written,

Early North American shortwave stations, including wartime verifications, which were hard to come by.

censorship of mail was frequent; letters were stamped "opened by the censor," and often paragraphs of a letter were cut out.

Some of you may remember that there were some letters which were written on a special form which was photographed at the sender's end; when it arrived in New Zealand, the film was developed and the letter was reproduced (similar to present-day photocopying), and mailed to the recipient. This was done to save weight, as hundreds of letters were produced on the one film. Mail delivery was slow: it took at least a year to get a reply from African stations. One also must remember that many ships were sunk carrying mail, and nondelivery of letters was a frequent problem during the war years.

A selection of North American mediumwave stations with powers of 250 to 50,000 watts heard at Arthur Cushen's location at Invercargill, New Zealand.



South Africa is the most difficult area for reception in New Zealand; these verifications span the history of broadcasting in the area.

We pick up on our survey in 1946, when the world was basically back to normal; worldwide reception was again possible and reception reports could be sent to any country. That year some 213 reports were posted, of which 131 came back to my mailbox, giving a percentage of 61 percent. Interestingly, the lowest return of verifications was in 1956, when some 195 reports were sent out and only 113 replies were received—a total of only 57 percent. But from then on the rate of returns increased: in 1966 there were 165 reports sent and 110 verified—66 percent; in 1976, 193 reports were sent with 137 verified, giving a percentage of 77 percent; and in a partial tally from January up to September 1995, 85 reports were sent and 56 replies were received, making 65 percent.

From these figures, one certainly gets the impression that interest in listeners' reports is still very much alive in most areas of broadcasting. The *manner* of confirming reception has, of necessity, changed over the years from the very personal letter in the 1930s to a printed form letter or prepared card in 1996. When sending reception reports to a station within Australia or New Zealand, it has been my policy in recent years to send a prepared card specially printed by the New Zealand Radio DX League, which you fill in and post to the station. It has return postage on it, so that it is only necessary for the station to check their log against the report to confirm reception.

Even so, the card may be accompanied by a personal letter from the broadcaster. In my many years of listening there have been some unusual verifications; last year an Australian station, knowing that I was blind, verified with a letter in braille.

■ A Summary of QSLs

Adventist World Radio (AWR) held a Best Verification Contest in 1995 in which I submitted five QSLs which were somewhat unusual: my **lowest powered AM mediumwave** station in Alice Springs, Australia, with a power of 30 watts; my **lowest powered shortwave** station, CKFX Vancouver, Canada, 10 watts; my **most distant shortwave** station, Godhaab, Greenland, 3393 kHz 1000 watts; the **most unusual verification on AM** from KGIR, Butte, Montana, sent on a sheet of copper in 1940; and the **smallest verification** from XEHH, Mexico City, 11880 kHz, submitted on a business card.

To summarize the areas of the world from which these confirmations were received I used the Continents List used for competition by New Zealand listeners' clubs. On the mediumwave AM band the total verifications is 3,000 from 166 countries, made up of verifications from Australia/New Zealand - 854; Oceania - 141; South America - 77; Central America - 107; North America - 1164; Europe - 145; Africa - 31; and Asia - 481. On shortwave, the total is 6,506 verifications from 300 countries: Australia/New Zealand - 354; Pacific - 464; South America - 590; Central America - 297; North America - 508; Europe - 2274; Asia - 1392; Africa - 624; and Antarctica - 3.

Sending reception reports in return for a verification of reception (also known as "QSLing") began as a way for the station to receive valuable information, and for the listener to acquire schedules and make a hobby out of their listening. I hope present day radio listeners will feel encouraged to know that the 60 percent return rate indicates that a majority of radio station still appreciate receiving this type of information. Your chances of receiving a reply are as good as when I first began sending reception reports 56 years ago!

Verifications from the Philippines from the days when it was a U.S. territory to the present.

MT REVIEW

Magnavox Web TV

By John Catalano

To those of you who enjoy reading about new technology, it comes as no surprise that a number of manufacturers have been working on bringing the Internet into your living room television. The first phase of development work is now complete. My family has been using a commercially available Magnavox Internet/TV set-top box since mid-October 1996. This box (Figure 1), which is the size and shape of a modern VCR, is connected to your telephone line and your television. The TV connection is via the TV's video input jack. Then, from your recliner, the World Wide Web is yours.

The Magnavox (Philips) product works pretty well. The TV display isn't nearly as good as an SVGA computer monitor display, but it is as good as I have seen from similar SVGA to TV converters, which allow you to use a TV with your computer (available at around $130).

Web TV uses a Rockwell 28.8 kbps modem chipset pushed to 33.3 kbps by software. This is part of the product's single analog/digital printed circuit board. For the technical people among us, the heart of the Magnavox is a 112 MHz, 64 bit Orion MIPS RISC CPU made by IDT (i.e., it's a pretty fast machine). The other printed circuit board is the power supply.

The box has lots of room in it. Is this in preparation for the next generation with digital video disk (DVD)? Good question. A smart card port, as yet unsupported, is behind a slide-up door on the front of the unit. Add to these indications a side "door" to allow access to a full data bus connector, and future hardware expansion seems a certainty.

Is Web TV for You?

For about $310 Magnavox's product does a good job of surfing the Internet. As a new home entertainment product it squarely hits the mark. People who are keyboard or computer phobic will be painlessly introduced to the vast information potential of the Internet.

Web TV does provide E-Mail capability, though it is a bit difficult, since typing of letters is done via a pull-up "keyboard" screen. Each letter has to be laboriously moved to via

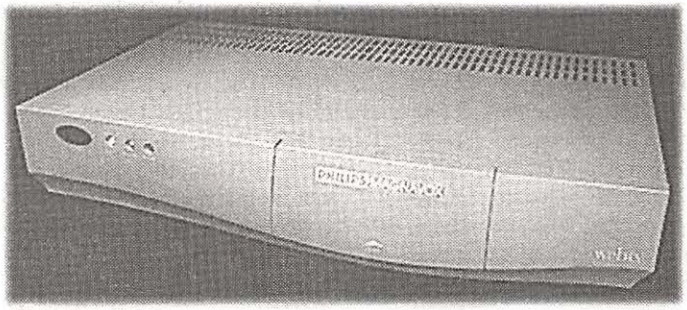


FIGURE 1

left/right/up/down remote control buttons. However, a standard keyboard (not included) can be plugged into the rear panel of Web TV if the E-Mail function is going to be used. Magnavox offers a sub-size wireless keyboard for $70, but it's not exactly a typist's dream, either.

Another add-on accessory is an RF modulator for TVs without a video input. Of course, if you didn't want to spend the extra money, you could use the video inputs of a VCR. An old VHS, or even Beta machine, would do the job and can be had for a few dollars at garage sales.

No matter what you use, don't expect SVGA video performance. No TV is up to it. For the hardcore Internet user the lack of a printer is also a very limiting factor.

Surfing on the Web is easily performed from Web TV's search engine page (figure 2). All engines are, of course, available. The firmware-included software appears to be a form of Microsoft's Explorer. Suffice it to say, everyone to whom I showed Web TV has really liked it.

Oh, What a Tangled Web (TV) We Weave...

Web TV is not without warts. My biggest disappointment was the fact that I could not use my existing Internet provider with the Magnavox product. It required me to spend $19.99 per month with another provider—called Web TV, of course. There is no screen allowing users to define their existing internet provider's IP information. Though not an outright deception, this fact was not made clear in the advertisements.

For new Internet users this may be fine. For existing Internet users this doubles their access costs. In an age of consumer choice of DSS TV provider, choice of long distance telephone company, and now even the choice of your electric company, something just doesn't seem right with the locked-in Web TV approach. Adding insult to injury, the Web TV provider does not have local telephone number access in all cities—including mine.

Bottom Line

The Magnavox product performs quite well with the remote control being the weakest link. If the user's expectation of video quality doesn't exceed the limitations of his television set, then it can be a useful and entertaining product. Giving the purchaser the choice of Internet providers, including the convenience of "plug and play" Web TV provider, *must* be included in the future. The addition of a VGA output connector, although counter to the primary purpose, could enable serious applications of the product.

FIGURE 2

I give high marks to Magnavox on the product concept and hardware, low marks on the firmware and flexibility. For latest pricing and availability check your local major TV, computer, or appliance store. I have heard an unconfirmed rumor that one store was giving the Web TV free with the purchase of a high-end 50-inch TV. Also check the Magnavox home page for details.

Magnavox Web TV is already here; Sony and others are about to introduce similar products. The future is here, and the yet-to-be produced $500 Oracle NC product is already over-priced and obsolete. Talk about a fast moving market!

WHAT'S NEW?

PRODUCTS AND BOOKS OF INTEREST TO THE RADIO HOBBYIST

by Larry Miller

Guest Reviewers: Rachel Baughn, Bob Grove, Gayle Van Horn, Dan Veeneman

Uniden BCT-12 Beartracker

Uniden's Beartracker series is intended to provide easy access to public safety frequencies for the highway traveler. There is no frequency display, just a two-character LED to identify the state of choice and certain functional callouts. Tiny and lightweight, the units can be attached to the windshield or dash by suction cups (provided) or to the sun visor. A short swivel antenna may be removed, exposing the BNC connector which allows attachment to a cartop antenna.

The newest entry, the BCT-12, covers low, high, UHF, and 800 MHz highway patrol, local police, sheriff, weather, news media, and transportation department frequencies for all 50 states and Canada. A tone alert can be selected for weather emergency broadcasts and detection of nearby highway patrol radios. Priority, channel lockout, and a digital signal level meter are included.

The BCT-12 is approximately $200 at your Uniden dealer.

— *BG*

PA Frequency Directory

Abbott Reid, N3JGT, has put together a hot, 25-page frequency directory for Jefferson and Clarion counties in Pennsylvania. Reid's book includes police, business, game commission, fire, EMS, Department of Environmental Resources, and utilities, among others. Information is arranged in two ways: by topic and by frequency. As best we can tell, this one is based on actual local monitoring, although Jefferson and Clarion counties are too far away from this editor's location to be able to double-check.

Of the home-grown frequency directories, this one is a standout. You can get your copy by sending Mr. Reid a check for $6.00 plus $3.00 shipping to Reid Enterprises, R.R. 1, Box 54-A, Sigel, PA 15860.

Scanning the Great White North

Checking into the 500+ page super-professional, glossy cover category is the new second edition of Palco Electronics' *Scanner Radio Listings for Michigan, Ohio and Ontario*.

What makes this one especially noteworthy is that there are over 50 pages of local signals and codes. Not only will you know the frequencies for Yellow Springs, Ohio, for example, but you'll also know that when you hear a code 71, someone in town has reported a drunk citizen to police. That's important, because not all that far away in Wayne County, Ohio, when the sheriff reports a code 70, it means an explosion has occurred.

Frequencies in this directory are arranged by state and community and include police, fire, ambulance, hospitals, aircraft, railroads, forestry, marine radio, and more.

You can get your copy of the Palco Electronics *Scanner Radio Listings* 2nd edition by calling 313-283-1313 and asking them to charge the book's $16.95 price to your credit card. You can also stop by the store in person at 18676 Eureka Rd., Southgate, MI 48195.

Radio Road Show

Years ago, every radio-obsessed young child owned (or coveted) a copy of *White's Radio Log*. *WRL* was a handbook, a guide to broadcast band radio monitoring. Hear a station and need to know what it is? Pull out your copy of *WRL* and fire off a QSL request.

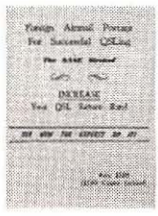
Radio on the Road is reminiscent of the old *White's Radio Log*, although it is produced for the traveler and not primarily the DXer (there are no station addresses, for example).

A compendium of over 14,000 radio (and TV!) stations across the US and Canada, it is arranged by state. If you're traveling through Texas and see a road sign up ahead for Beeville, you need only locate "Texas" in the book and go down the alphabetized list to "Beeville" where you'll find the listings for KIBL-AM (1490), KYTX-FM (97.9), and KFRD-AM (1090). Each listing contains the town name, call letters, frequency, and format code.

You can get your copy of *Radio on the Road* from Grove Enterprises for $12.95 plus $3 book rate shipping. Call 800-438-8155 to order.

Successful QSLing

Attention QSL collectors! Would you like to increase your QSL return rate? Bill Plum of Airmail Postage & DX Supplies has published *Foreign Airmail Postage For Successful QSLing, The SASE Method*—a 20 page, spiral soft bound book of practical tips proven by the experts. These methods, used by amateur radio operators, have earned a return rate of over 90%! These successful tips may apply to SWBC DXers as well.



Topics include; *IRCs and Green Stamps, What Happens on the Other Side, The Foreign Return Postage, Goodies*, and more!

Bill's fine book, at an affordable $5.00, could be just the answer you've been seeking! Included with your book is a $5.00 coupon, and price lists for worldwide mint stamps and related DX supplies.

Write Bill at 12 Glenn Road, Flemington, NJ 08822-3322. And don't forget to report all those QSLs you receive to *MT's* "QSL Report"!

— *GVH*

SGC Power Clear

The beauty of audio digital signal processing is that it provides the ability to strip away everything but the desired signal. Even if the audio is less than perfect, your chances of being able to discern intelligible sounds are much greater without background hiss or interference from nearby stations. Newer, high-end receivers have DSP built into them, but what if you have an older model?

The SGC PowerClear is an add-on signal processing unit that can be used with HF/VHF/UHF receivers or transceivers, telephones, cassette tape recorders—any device that could benefit from audio enhancement. Even data reception can be stripped of interference.

The small 3.65 inch by 6.65 inch unit contains a built-in speaker and requires a 13.6 VDC power supply. Two input jacks for low or high impedance allow a variety of input sources. The internal speaker is disabled if an external speaker is plugged in,

and a PTT connection mutes the audio during transmit if it's used with a transceiver.

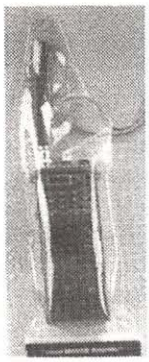
Notch filter settings are user-programmable and can be saved in memory for quick recall.

The price quoted on SGC's Web site (**www.sgcworld.com**) is $395. For more information on the PowerClear, contact SGC, Inc., P.O. Box 3526, Bellevue, Washington 98009, phone 800-259-7331 or 206-746-6310, or e-mail SGCMKTG @aol.com. Tell them *MT* sent you.

— RB

Lifeguard! Save That Radio!

One of the standard summer warnings for scanner owners is to never take your scanner to the beach! While beaches are still interminable months away for many of us, it's good advice for anyone using a scanner near any water, such as outside on rainy days or wherever moisture could get



into your expensive radio gear.

EEB is now offering "Water Sound." It's designed to protect your favorite handheld scanner, GPS, VHF, or CB radio (fits radio size up to 2.5"W x 1.75"D x 7.5" with 15" antenna) from the elements.

Water Sound is more than just a zip-lock baggie. Its special design provides no-loss sound and distortion-free transmitting and receiving. Waterproof to 30 feet, Water Sound can add years to your radio's life.

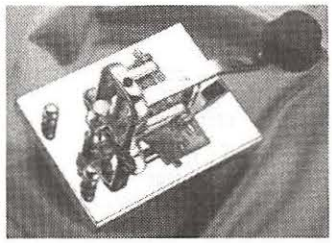
You can get a Water Sound radio protector from EEB for $24.95 plus $6.95 shipping. Their order line is 800-368-3270 or you can mail in your order at 323 Mill Street, NE, Vienna, VA 22180.

Going Straight

For the first time in the company's over 100 year history, Vibroplex has added a straight keyer to its line of products.

As *WorldRadio* says, "The design is distinctively Vibroplex.

"A heavy solid steel base anchors the Straight Key to the operating position. The lever arm pivots in the famous Vibroplex chromed mainframe. A stainless steel spring allows complete control of the tension, and the



Straight Key has the famous brass Vibroplex logo plate with a unique serial number pinned to the top of the base with stainless steel pins.

"There are only a limited number of Straight Keys being manufactured. In fact, Vibroplex has limited dealers to a maximum of ten each and the first keys manufactured will have the lowest serial numbers."

The Straight Keyer comes in two models. The deluxe hand key is $174.95; the standard model is $139.95. You can request more information on the Vibroplex Straight Keyer by contacting the manufacturer at 800-840-8873 or by writing to them at 11 Midtown Park East, Mobile, AL 36606.

Radio Free Pyramid

What's shaped like a pyramid and uses radio waves to feed the latest sports scores into your com-

puter? It's called NewsCatcher.

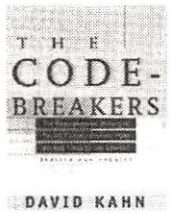
Instead of using a modem, NewsCatcher is a slick-looking radio receiver that picks up AirMedia Live, a proprietary paging network. The information from AirMedia Live—headlines, sports, entertainment or business news—is then funneled into your computer without using a modem.

The cost of a NewsCatcher is $150.00. There's also a $6.00 a month fee for the news feeds. To order or to get more information, call 1-800-227-0697.

Thanks to Chet Copeland of Washington, DC, for that one.

The Code-breakers

If you enjoyed this month's feature article on Menwith Hill and the gathering of signal intelligence, *The Code-breakers, The Comprehensive History of Secret Communication from Ancient Times to the Internet* may be just what you need for further reading.



Codes and ciphers have been intertwined with civilization since the beginning of recorded history. Ancient Egyptians and Babylonians used codes on papyrus and clay tablets, and the practice of hiding secrets from prying eyes continues to this day. With the advent of the Internet and the proliferation of computers, cryptographic systems are today available to civilians. The story of how these systems came about, and what came before them, make up the fascinating history of cryptography.

David Kahn, a *Newsday* editor and former visiting National Security Agency historian, has updated his 1967 classic history of secret communication. The unabridged 1996 version weighs in with more than a thousand pages of "the history behind history." Great battles won and lost, lives saved and ruined, secrets kept and revealed due to the use and misuse of cryptography are detailed in this extensively referenced and illustrated book. Kahn's chronology of the battle between code makers and code breakers starts 4000 years ago and continues to present day.

The final chapter, new to this version, covers the World War II Ultra secret, where American, British, and Polish scientists broke the German Enigma cipher machine. It also relates the controversy surrounding the NSA-influenced Data Encryption Standard and the recent development of public-key cryptography.

If you could own only one book on cryptography, this would be the one to choose. Written in a clear, accessible style, this book sheds light on secrets kept hidden from history and stories that remained untold until now. David Kahn is also the author of *Seizing the Enigma*, *Kahn on Codes*, *Hitler's Spies*, and a number of articles and publications. *The Code Breakers* is published by Scribner and retails at $65, though you should find it at a discount at most book stores.

If you would like to try some hands-on code-making and code-breaking, consider joining the American Cryptogram Association. This group of amateur cryptographers share an interest in solving different historical ciphers, and may be reached at RR 3, Box 987, Meredith, NH, 03253-9401.

— *DV* **dan@decode.com**

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Hwy 64 West, Brasstown, NC 28902 Press releases may be faxed to 704-837-2216 or e-mailed to mteditor@grove.net.

Lawrence Magne
Editor-in-Chief, Passport to World Band Radio

Becker Mexico 2340 World Band Car Radio

Obviously, most motorists are happy with what they find on their local stations—or those stations would be carrying other types of programming. But for some of us, channel after channel of rock music and talk radio can wear thin. Something better is needed, and that something can be world band radio.

Thing is, just try to find a shortwave car radio! Philips made the excellent DC777 a few years ago, but except for some converter-tuners—which don't work very well—there really hasn't been much available in the way of car shortwave radios.

Superior quality of construction

Until now, that is. The German firm of Becker has started producing the Mexico 2340, which covers longwave, AM, FM, and shortwave from 5900-15700 kHz. It also has an inboard stereo cassette player, and there's an optional outboard CD changer if you want it. It appears to be exceptionally well constructed—which is hardly surprising, given that Becker makes the radios used in Mercedes Benz automobiles.

Fortunately, you don't have to buy a Mercedes to get this radio. In the United States, it sells for $550, plus installation by you or a local auto stereo dealer. This isn't cheap, but it's less than you might expect to spend on a German radio of this caliber.

Car environment limits reception

But, will shortwave really work in a car? After all, a car has all sorts of electrical devices which can disrupt reception, such as spark plugs, wiper motors, and microprocessors—a potential minefield of man-made noises.

The answer is that it depends on your car and what you want to hear. At one extreme are some diesel vehicles with no spark plugs to cause noise, so shortwave works perfectly well. At the other end are old cars with defective ignition wires and other shortcomings that are so bad they can even disrupt reception of local stations. But most modern cars are designed not to interfere badly with radio signals. So a car shortwave radio can work well for hearing the major international broad-

casters—plus some smaller ones, as well—but not serious DX.

Besides electrical noises that can bother faint signals, cars have small radio antennas. And remember, even a $550 car radio isn't the equivalent of a serious tabletop communications receiver with a large outdoor wire antenna, which is what's best for DXing.

Another fly in the ointment is that you can pay only so much attention to your radio before your driving is compromised. The Mexico's ergonomics are okay for this purpose, but having a keypad in the standard telephone format would have been better than the offbeat horizontal key layout used on this radio.

Audio quality second to none

What might surprise you is that car shortwave radios can sound better than regular shortwave radios. That's because they're designed from top to bottom as part of a high-fidelity audio system. In fact, the Becker Mexico 2340 sounds at least as good as any other shortwave radio I've come across in the past 35 years.

The Becker's performance, which was tested by three of us in different parts of the Eastern United States, is about on par with that of the best portables in the $100 price class. It has digital frequency readout, 1 kHz tuning increments, ten shortwave presets, signal-seek scanning and direct-frequency keypad tuning. Its sensitivity to good signals is quite reasonable, too—and, as we've already noted, its adjacent-channel rejection is good.

But image rejection is only fair. And there's some chugging when you tune up and down the bands. Still, the only serious flaw that we found is with frequency coverage. Granted, this is primarily a well-constructed mobile audio system with shortwave added. But still, for $550 it should cover more of the shortwave spectrum—say, from 4.7-21.9 MHz, adding three bands to its existing coverage. At the very least, its 49 meter coverage should go down to 5730 kHz, instead of stopping at 5900 kHz.

Another thing is that the Becker's AM coverage is only from 531 to 1600 kHz. In North America, the AM band runs from 530-1700 kHz, so the Becker misses ten channels at the high end, and is 1 kHz off from one Canadian channel at the low end.

Even then, all the panelists liked this radio. Not only does it make for exceptionally pleasant listening, it's built to last, which is something the Philips DC777 sorely lacked. How long, depends—but I have a Becker car radio made in late 1973. All I've had to do to it in 23 years is replace the dial light bulb a couple of times. Most of my other car radios have acted up after just a few years.

Market too small for much competition

Sony, and perhaps others, reportedly make shortwave car radios for sale in a few countries in Asia, but otherwise Becker seems to have the market pretty much to itself. I've talked to a couple of firms selling these Becker radios, and back when Philips offered the DC777 I was in contact with most of its vendors. Then, just as now, this has been a very small market.

Take the United States, for example. Here, over half a million shortwave radios are sold annually, but well under a thousand of these are car radios. If a company decided to really push these, they might catch on to some extent. But the resulting sales are unlikely to justify the promotional and related expenses, unless the radio were really cheap to manufacture, so the profit margin would be great enough to cover those expenses. So the most likely outcome is that the market will inch up slowly over the years—and if it gets big enough, perhaps there will be another choice or two.

Another limitation is that most cars already come equipped from the factory with radios. These are mass-production items, sold each year in the tens of millions. There's no way shortwave is going to fit into that kind of market environment. Even if they were sold with new cars, most people would be confused by shortwave, so they'd be bothering the car dealers to find out how to operate them, or they might think the radios were defective and bring them in for service. Of course, no dealer

wants to even think about having this kind of headache.

Great to have during long drives

But the bottom line is that you can remove your existing car radio and replace it with the Becker Mexico 2340, then meander around the countryside listening to news and entertainment from all over the globe. Some years ago, my wife and I took a leisurely trip around much of the western United States in our car. Sometimes, all we could get other than shortwave were a few boring stations, and we'd gotten tired of our stack of recorded music. But a push of the controls would bring in the BBC and dozens of other world band stations. My wife is normally not a big shortwave fan, but even *she* enjoyed it then, especially because the audio quality was so pleasant.

So I think that if you're doing a lot of intercity driving and enjoy the programs found on shortwave, the Becker radio may very well be a good investment.

He liked it so much he started the company

One fellow liked it so much he made a career out of it. Robert Schneck was listening on his new Becker shortwave radio to a CBC talk show that was discussing some lofty international topic over RCI, so he called in on his car phone to comment. They asked where he was calling from, and he replied, "Long Island, New York, on my car radio."

That did it! The rest of the show, they quit discussing Bosnia or whatever, and talked about shortwave listening. He got so excited about the prospects of listening to shortwave in cars that he founded RJS Almost Direct to sell those same Becker shortwave car radios to the general public!

There are now two mail-order firms selling Becker shortwave radios in North America. RJS can be reached toll-free at (800) 757-3728, or by e-mail at rjsdirect@aol.com. The other vendor is Erie Aviation International at (800) 395-8934, e-mail shancock@eire.net. Outside North America, contact the factory at Postfach 742260, D-76303 Karlsbad, Germany.

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

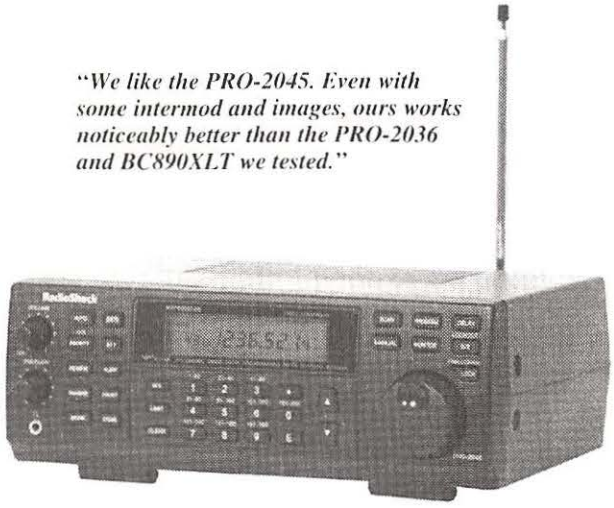
Bob Parnass, AJ9S

The Radio Shack PRO-2045

We tested a Radio Shack PRO-2036 and its Bearcat BC890XLT twin in June 1995 *MT* and found their performance disappointing. It is with relief that we report this month on an improved replacement—the new PRO-2045.

The PRO-2045 is built in the Philippines for Radio Shack by Uniden and lists for about $350. It is powered from 12 VDC, but can be operated with the supplied AC wall wart.

"We like the PRO-2045. Even with some intermod and images, ours works noticeably better than the PRO-2036 and BC890XLT we tested."



Memory

The PRO-2045's 200 memory channels are distributed among 10 banks of 20 channels each. A hit counter, attenuator, and two second rescan delay can be programmed for each channel, an improvement over the PRO-2036's global delay. One channel in each bank can be designated as a priority channel and sampled every two seconds. There are 10 monitor memories, as found in other Radio Shack models.

At about 80 channels/sec., memory scanning is very fast, and users can choose to scan memories in frequency or channel number order within banks, the former providing speedier scanning. Memory is backed up by a capacitor. The owner's manual claims backup is good for only three short days, but we didn't verify it.

Effective Searching

The PRO-2045 provides three types of searches: direct, limit, and auto. Direct search commences from the currently displayed frequency. Limit search is bounded by programmable search limits and one search bank is provided. The auto store feature works great, storing unique, active frequencies found during a search in banks you specify. Up to 50 frequencies can be locked out during a search—a big improvement over the PRO-2036 and useful for ignoring paging frequencies and birdies.

NOAA weather frequencies are preprogrammed and available at the touch of a key. The weather alert can be armed so the PRO-2045 will sound a loud tone when it detects the severe weather warning signal transmitted by NOAA stations. We used the built-in alert test feature, but didn't test the PRO-2045 with an actual NOAA alert.

Other Features

A $40 CTCSS decoder module (RS catalog #20-0031) can be specially ordered from Radio Shack for the PRO-2045, and it's a worthwhile addition. The Uniden BC-005 CTCSS board from our BC9000XLT plugs right into our PRO-2045 and works like a champ. Once equipped with the decoder, a different CTCSS code can be associated with each memory channel. Unfortunately the CTCSS decoder cannot be activated in search mode or while tuning around using the tuning knob.

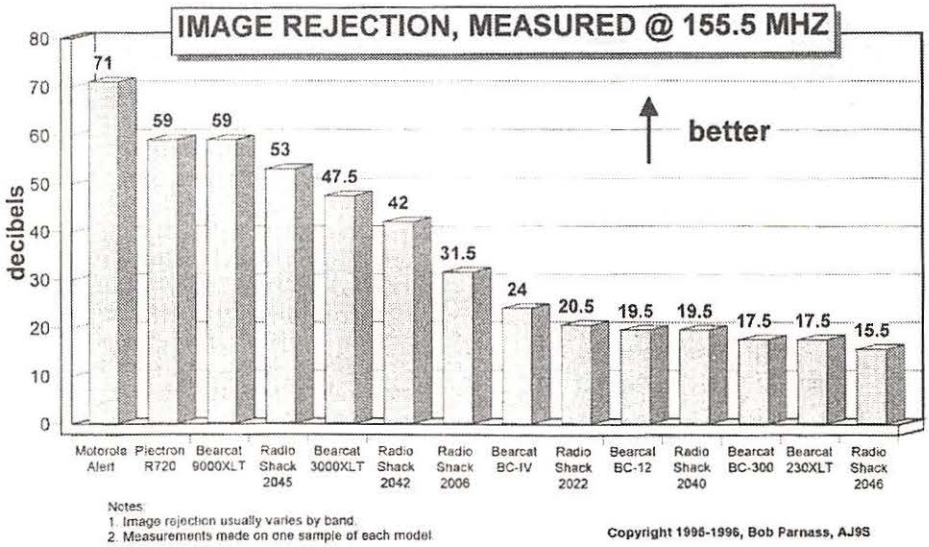
The tuning knob acts as either a channel selector or VFO. The data skip feature leaps over some paging signals, but isn't as effective on data signals and trunked control channels as the ICOM R8500's VSC. The auxiliary recorder control function found in the older PRO-2036 was eliminated from the PRO-2045.

Performance

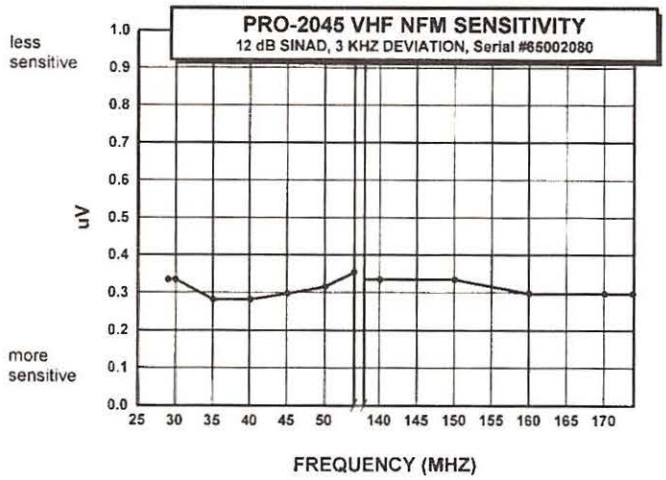
The PRO-2045's first IF is 380.7 MHz, which means that images due to this IF are 761.4 MHz away from the frequency on the display. Although the image rejection is much better than in scanners with a 10.7 or 10.8 MHz IF (see bar chart), images of cellular phone conversations appear in the 108-132 MHz air band, attenuated by 42-48 dB.

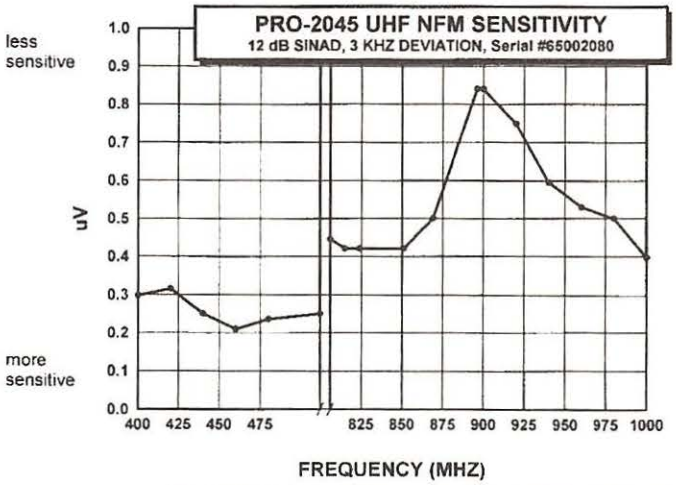
Images of a few strong 900 MHz signals are evident in the VHF-high band, most prominently in the 160-174 MHz range, where image rejection measures 50 to 54 dB.

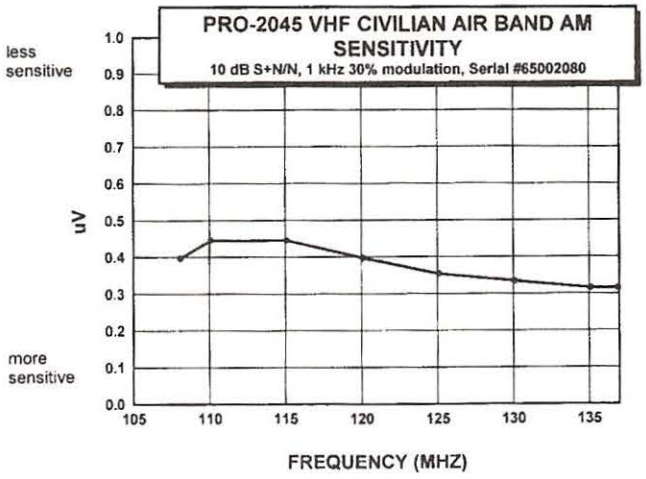
Our PRO-2045 experiences some intermodulation, too. For example, pagers on 158.7 and 163.25 MHz mix and produce an intermod product near 154.155 MHz. The



Notes:
1. Image rejection usually varies by band.
2. Measurements made on one sample of each model.







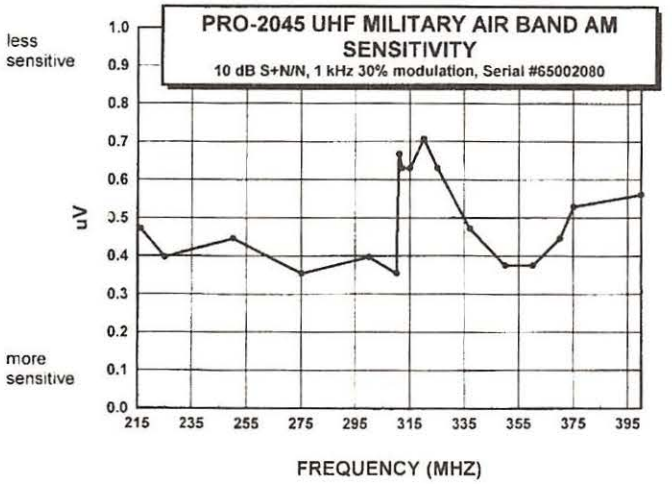


TABLE 1: Measurements, PRO-2045 S/N 65002080

IF's: 380.7, 10.85, and 0.450 MHz
Modes: AM, NFM
Frequency coverage:
- 29-54 MHz in 5 kHz steps
- 108 - 136.975 MHz in 12.5 kHz steps
- 137 - 174 MHz in 5 kHz steps
- 216 - 399.9875 MHz in 12.5 kHz steps
- 400 - 512 MHz in 12.5 kHz steps
- 806 - 823.9375 MHz in 12.5 kHz steps
- 851 - 868.9375 MHz in 12.5 kHz steps
- 896.1125 - 1000 MHz in 12.5 kHz steps

FM Modulation Acceptance: 12 kHz
Audio output:
- 0.7 watts @ 10% distortion into 8 ohms at headphone jack

Practical scan rate:
- 80 channels/sec (Hyperscan)

Search rates:
- 100 steps/second-12.5 kHz step size
- 300 steps/second-5 kHz step size

same mix produces intermod on our BC9000XLT, but not on our ICOM R8500. The PRO-2045's attenuator removes the intermod but diminishes weaker signals we want to hear.

Audio from the top-mounted speaker is clean and produces a good punch.

PRO-2045 vs. BC9000XLT

The PRO-2045 vaguely resembles the top line Uniden/Bearcat BC9000XLT, but there are several differences. The BC9000XLT is larger and housed in a metal cabinet and frame. The smaller, lighter PRO-2045 is entirely plastic. The main circuit board in the BC9000XLT is much larger, and many stages are shielded in separate metal compartments.

The BC9000XLT tunes these ranges, censored in the PRO-2045: 54-108, 174-216, 894-896.1, and 1000-1300 MHz.

The IF arrangements are very different, too. The BC9000XLT IFs are 254.4 or 380.7, 58.075, and 5.5 or 0.455 MHz, depending on the band and mode. The PRO-2045's lineup is 380.7, 10.7, and 0.450 MHz.

Both models incorporate a yellow backlit LCD display, but BC9000XLT users can dim or disable the backlight. The BC9000XLT has several selectable tuning step sizes, alpha display, WFM mode, recorder activator, tape jack, and 500 channels versus 200 in the PRO-2045. The BC9000XLT lacks preprogrammed weather search and alert.

Wrap-up

We like the PRO-2045. Even with some intermod and images, ours works noticeably better than the PRO-2036 and BC890XLT we tested. It has selectable rescan delay and AM/FM modes, search lockout, etc. However, the BC9000XLT is more radio and a better value at its $380-$390 street price than the PRO-2045 at $350 list price, so watch for sales.

Clem Small, KR6A, CET

Radio au Naturale: Is the Sky an Antenna?

Last month we covered natural radio signals and the use of trees as antennas. That's unusual, but would you believe an island in the sea has been used as an antenna? It's true! One reference says that the island, although it was planned as a slot antenna, acts more like a Beverage antenna.

So if an island can work as an antenna, how about the water the island sits in? Old-time radio-pioneer Fessenden used antennas made from columns of water pumped to shoot high in the air. He reported that a water-column antenna of 40 meters height worked stations just as far away as did a metal antenna of the same height. And one reference to the use of ionized-air columns as antennas says that "It may be possible to excite the ion column behind the satellite as a leaky waveguide antenna." Another reports, "a gas discharge column was used as a tuneable antenna..."

As far back as 1916 Hettinger suggested using beams from tungsten-arc searchlights, mercury vapor lamps, or other sources as powerful ultra-violet radiation to ionize the air into ion-column antennas. Blake followed this by making such columns on a much-smaller scale with radium-coated wire spirals. Using them he was able to transmit across a lecture room.

In September 1988 *Popular Science* reported that a one-megawatt signal was beamed into the sky above Fairbanks, Alaska, and that this "...heated the charged particles of the ionosphere...turning them into an antenna that could reflect low-frequency signals efficiently."

Perhaps the ultimate in unusual antennas is the use of our bodies as an antenna. All of us who have ever put a finger on the antenna-input terminal of a radio receiver and heard the receiver come to life with signals, know that our bodies can function as antennas. The British Institution of Electrical Engineers *Handbook of Antenna Design* reports a study in which the human body performed essentially like a metal whip antenna from about 40 to 70 MHz. And, lest we forget the animal kingdom, there are serious scientific studies reporting that bird feathers, and the "sensillium" of lovebugs have, been shown to function as antennas.

One component essential to many antenna systems is a ground connection. Believe it or not, bushes and trees have provided grounds in many instances. At the Smithsonian Institution I found the following in Lee DeForest's *Instructions for Portable Radiotelephone*: "If in the woods, an excellent ground can be obtained by driving a large spike (nail), ...into the trunk of a live tree near its root." DeForest's also wrote in his autobiography, *DeForest: Father of Radio*, how he obtained good results when he "...skinned the bark off a small bush for my earth connection."

Other natural radio-system components which have been utilized across the years include a "taste sensor" which would allow an operator to copy Morse code at five or ten words per minute using a device held in the

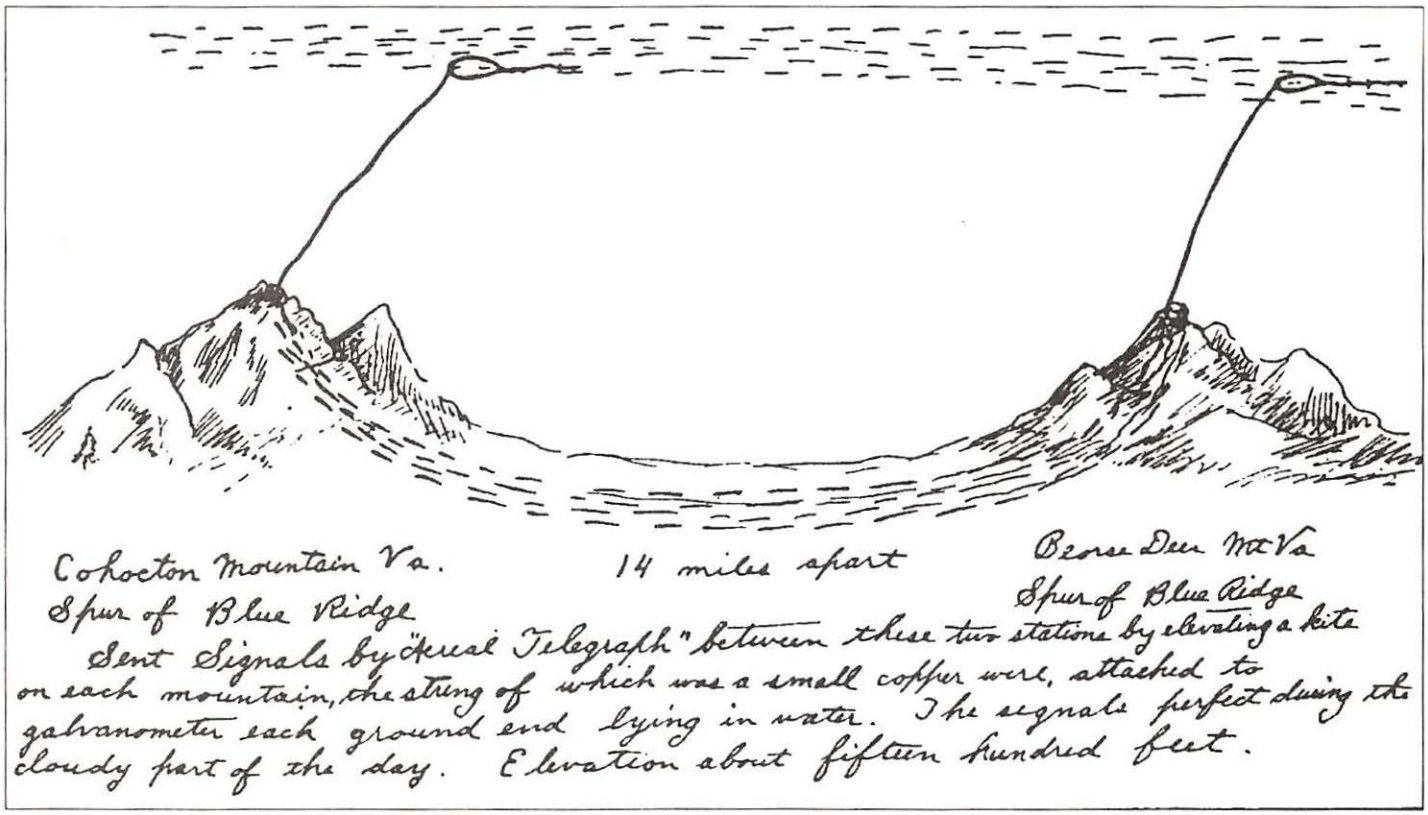


FIGURE 1: *Mahlon Loomis's 1865 sketch of the first "antennas," and his successful "wireless" communication system. (from Radio Theory and Operating, Mary T. Loomis, 1927).*

lips or mouth. A. F. Collins used brains, cat to human, as detectors of radio signals. There are several reports of using frog-legs to detect radio signals. One French report mentions using such a detector to receive time signals from a station in Paris.

Mahlon Loomis believed that by flying kites with metal tethers high enough he could connect to a "natural battery" in the atmosphere. Utilizing kites flown from two separate mountain tops, and a ground connection on each mountain, he was able to communicate between mountain tops by switching the current flow in this circuit on and off. It wasn't RF, but it was "wireless." Coincidentally, Loomis is credited with introducing the term "antenna" which eventually replaced the older term "aerial."

In 1909 a man named Maurice Child used static electricity induced into his antenna as the power for his spark-gap transmitter. He communicated over a distance of three miles, and said that, considering the length of spark which the static produced, he could probably have communicated over a distance of 100 miles.

Could we have a totally natural-component radio system? How about lightning as the transmitter (see last month's column), the lightning's ionized path as the transmitting antenna, our bodies as the receiving antenna, and our brains as detectors? Ouch!

Ho Hum

It's time to address the old mysterious hum again. In the past I have mentioned the strange and legendary hum which some say sounds like a truck idling in the distance. I've checked with my local source on the hum—an appliance repairman who has heard it in the past—and he says it hasn't been around his area lately. I did note, however, that, back in the December '95 *Electronics Now*, Larry Klein discussed theories which attribute the source of the hum to various causes. These vary from the by-now traditional idling diesel engine, to the sound of a sewage pump, to "resonant channels" due to atmospheric inversions, to the more exciting idea of secret government VLF transmissions, and to the even more exciting idea of aliens communicating with their mother ship. The suggestion which I like best, however, is where Klein says that, as far as he knows, no one has suggested that the "something is humming simply because it doesn't know the words."

Kidding aside, the prevalence of this type of sound at various locations around the world, and the failure of serious scientists who have tried to find its source, seem to rule out simple explanations. I still wonder about the possibility of extremely low frequency electromagnetic waves from an as-yet unknown, extra-terrestrial source interacting with natural antennas and natural detectors in our environment. If anyone has any recent findings on the elusive hum phenomenon, I'd be pleased to hear of them.

RADIO RIDDLES

Last month

We talked about what radio waves might look like if frozen at one moment in time. Then I had the audacity to ask, "What would those rascals look like if we could stain them, and we also had the advanced eyes and brains of some specialized android so that we could watch them zip along on their 186,000 miles per hour flight from the transmitting antenna to our receiving antenna? What would we see then?"

Let's consider waves from a beam antenna. We'd likely see the "zebra" stripe pattern of the previous month's riddle answer moving continuously from the transmitting antenna to the receiving antenna. Recall that these stripes vary from darker to lighter indicating greater and lesser levels of field strength for the signal. As these stripes move away from the transmitting antenna they would spread out as does a beam of light, and so we'd see them getting gradually less intense. If we looked around to where the signal encountered various reflective surfaces we'd see interaction between the original waves and the reflected waves such that some stripes would get lighter or disappear, and others would get darker.

Another thing that might interest us, if signal propagation was right, would be a broad, faint wavefront approaching the transmitting antenna from behind, as the signal came in from a completely around-the-world trip!

Also, if we look closely at the *receiving* antenna we might get a surprise as a lighter zebra-pattern emerged from that antenna! That's right, a receiving antenna retransmits some of its received energy! We'd see all these things and more. The action of radio waves leaving a transmitting antenna and encountering the rest of the world is a very complex situation. We've only touched the tip of the iceberg.

This Month

Why do you care if your antenna is resonant? Maybe you don't. If you don't, should you? What is "resonance" anyhow?

You'll find an answer for this month's riddle, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.

SPECIAL EVENT CALENDAR

Feb 1	Amarillo, TX	Potter-Randall ARES-RACES / Ben Pollard, WS5R, PO Box 5378, Amarillo, TX, 79117 806-381-8810
Feb 1-2	Miami, FL	SE Div Conv / Evelyn Gauzens, W4WYR, 2780 NW 3rd St., Miami, FL 33125, 305-642-4139, Fax: 305-642-1648
Feb 1-2	Jackson, MS	Mississippi State / Travis Cliett, AB5ZE, 117 Beechtree Lane, Florence, MS 39073, 601-939-9236
Feb 2	Livermore, CA	Livermore ARK / Noel Anklam, KC6QZK, 474 Humboldt Way, Livermore, CA 94550, 510-447-3857
Feb 8	Arcadia, FL	Desoto ARC / Doug Christ, KN4YT, 941-494-5070
Feb 8	Milton, FL	Milton ARC / Mark McAnally, KE4QKN, 904-626-7686
Feb 8	LaCygne, KS	Mine Creek ARC / Bill VanKirk, AA0CP, PO Box 83, Mound City, KS 66056, 913-795-2080
Feb 8	Blaine, MN	Robbinsdale ARC / Susan Baker, N0JND, 5300 Three Points Blvd., Mound, MN 55364-1124, 612-537-1722
Feb 8	North Charleston, SC	Charleston ARS , Jenny Myers, WA4NGV, 2630 Dellwood Ave., North Charleston, SC, 29405-6814, 803-747-2324
Feb 9	Mansfield, OHI	nterCity ARC, Mansfield Emergency Rptr. / Pat Ackerman, N8YOB, 63 North Illinois Ave., Mansfield, OH 44905, 419-589-7133
Feb 9	Latrobe, PA	Chestnut Ridge ARC / Bill Demosky, K3AFS, 1740 Raymond Ave., Latrobe, PA 15650-3039, 412-539-1552
Feb 14-16	Orlando, FL	No Fla Section / Orlando ARC, John Lenkerd, W4DNU, 1046 Turner Rd., Winter Park, FL 32789, 407-645-2026
Feb 15	Marlborough, MA	Algonquin ARC / Ann Weldon, KA1PON, PO Box 258, Marlborough, MA 01752, 508-481-4988
Feb 15	Traverse City, MI	Cherryland ARC / Joe Novak, W8TVT, 616-947-8555
Feb 15	Horseheads, NY	ARA of the Southern Tier / Jack Slocum, 410 Shelbourne St., Horseheads, NY 14845, 607-739-4866
Feb 15	Rickreal, OR	Salem Rptr Assn & OR Coast Emerg Rptr / James Pardey, WA7ZAJ, PO Box 784, Salem, OR 97308, 503-651-3216
Feb 15	Oberlin, PA	Harrisburg RAC / Tom Hale, WU3X, PO Box 418, Halifax, PA 17032, 717-232-6087
Feb 15	Smithville, TX	Bastrop County ARC / Charlie Claiborne, N5JWP, RR 1, Box 32A, Smithville, TX 78957, 512-360-3670
Feb 16	Brighton, CO	Aurora Rptr Assoc / Janice Chistopherson KA7TYU, 4376 S. Argonne Way, Aurora, CO 80015, (303) 403-1883 or cknauer@skywarn.org (Chris Knauer KB9CCR). Location: Adams Co Fairgrounds, 9755 Henderson Road, 8:30am-2pm.
Feb 16	New Westminster, BC	Burnaby ARC / Harry Curtis, VE7HNC, Box 72012, 4429 Kingsway, Burnaby, BC V5H 4P9, 604-530-3962
Feb 16	Rock Island, IL	Davenport RAC / Don Schneider, WD0AMA, 518 West Locust St., Davenport, IA 52803-2898, 319-388-0108, Fax: 319-333-6218
Feb 16	Freeport, NY	Long Island Mobile ARC / Mark Nadel, W2OT, 22 Springtime Ln., Levittown, NY 11756, 516-796-2366
Feb 16	Elkin, NC	Briarpatch ARC & Foothills ARC / Jimmy Holbrook, KB4GKI, Rt. 1, Box 567, Ronda, NC 28670, 910-957-3820
Feb 22	Russellville, AR	Arkansas River Valley AR / Dallas Scott, KD4TNQ, 251 Estes Circle, Russellville, AR 72801, 501-967-3317
Feb 22	Spring Hill, FL	Hernando Co ARA / Lee Kent, WA3YMV, PO Box 1721, Brooksville, FL 34605, 352-799-1638
Feb 22	Dalton, GA	Dalton ARC / Harold Jones, N4OTC, PO Box 143, Dalton, GA 30722-0143, 706-673-2291
Feb 22	LaPorte, IN	LaPorte ARC / John Rozinski, N9ROH, PO Box 30, LaPorte, IN 46352
Feb 22	Bismarck, ND	Central Dakota ARC / Dean Summers, KQ0C, 701-222-3532
Feb 22	Orange, TX	Orange ARC / Irene Thomas, N5GNF, PO Box 232, Orange, TX 77630, 409-745-3061
Feb 22	Milton, VT	Radio Amateurs of N Vermont / Mitch Stern, WB2JSJ, PO Box 99, Essex, VT 05451-8099, 802-879-6589
Feb 22-23	Cincinnati, OH	Great Lakes Div Conv / Stanley Cohen, WD8QDQ, 2301 Royal Oak Ct., Cincinnati, OH 45237, 513-531-1011
Feb 23	Westford, MA	Gtr Boston Antique Radio Collectors / Lisa Friedrichs, PO Box 2, Carlisle, MA 01741, 508-371-0512
Feb 23	Dearborn, MI	Livonia ARC / Neil Coffin, WA8GWL, PO Box 51532, Livonia, MI 48151-5532, 313-261-5486
Feb 23	Cuyahoga Falls, OH	Cuyahoga Falls ARC / Bob Recny, N8SQT, 496 Orlando Ave., Akron, OH 44320-1243, 330-864-5810, Fax: 330-864-5879

Send anouncements of events or club information to: Editor, Monitoring Times, P.O. Box 98, Brasstown, NC 28902-0098. Fax 704-837-2216; e-mail mteditor@grove.net. See MT's homepage on **www.grove.net** for complete listings.

CLUB CIRCUIT

North American Club Listings C-I

New Listings!

Brian Cathcart has started a scanner club called the Palm Beach County Scanner Group (PBCSG) in the Palm Beach, Florida, area. To join the fun, you may contact him at 4050 Edgewood Drive, Coconut Creek, FL 33066-1835, email <scannerdude@juno.com>

American Eagle SSB CBers Club: Keith L. Herzig KC5LPQ, P.O. Box 751, Chester, MA 01011. Sun eve net/chat 37 LSB 9 p.m. Free sample newsletter.

Central VA Radio Enthusiasts: Richard Rowland, POB 34832, Richmond, VA 23234-0832. Metro Richmond and vicinity. VHF/UHF. SASE. No newsletter, no dues. Meets quarterly in Richmond.

Chicago Area DX Club: Edward G. Stroh, 53 Arrowhead Dr., Thornton, IL 60476. 300 mile radius of Chicago; DXing all bands. *DX Chicago*. $17, $1 sample. Meets irregularly.

Chicago Area Radio Monitoring Association (CARMA): Ted & Kim Moran, Box 2681, Glenview, IL 60025. Chicago & midwest. Public safety & general coverage. CARMA BBS (630) 852-1292. Fax: (630) 612-0609. *CARMA Newsletter*. Meetings (Sats) and newsletter bi-monthly on alternate months.

Colorado Shortwave Listeners Club: Rob Harrington N0NNI, P.O. Box 370593, Denver, CO 80237-0593, 303-756-9455. Colorado residents. Longwave, shortwave. 35 cents plus SASE for info or Internet YABX92A@prodigy.com.

Communications Research Group: Scott Miller, 122, Greenbriar Drive, Sun Prairie, WI 53590-1706. Wisconsin area. Scanning.

DecalcoMania: Paul Richards, P.O. Box 126, Lincroft, NJ 07738, (908)591-2522. Worldwide AM, FM and collecting radio related items. *DecalcoMania*. $10 US, $11 Can/Mex, $16 Eur, $17.50 Asia/Pac.

DX Audio Service (National Radio Club): Ken Chatterton, P.O. Box 164, Mannsville, NY 13661-0164, (315) 387-3583; http://wcoil.com:80/~gnbc/ Worldwide. North American Broadcasters. *DX-Audio Service* (90-min.tape). Sample $3.

Fire Net: Tom Kravitz, Box 1307, Culver City, CA 90232, 310-838-1436, internet mpage@netcom.com. All of California; fire, EMS, tied in with nationwide notification net.

Fire Notification Network of Michigan: Garry Watts, PO Box 1312, Warren, MI, 48090-1312 810-772-4423; firenet@usa.net. Michigan alphanumeric pager net, breaking news via text pager. Customizable options available.

Houston Area Scanners & Monitoring Club: Glen Dingley, 909 Michael, Alvin, TX 77511, (713) 388-1941. 75 mile radius of Houston, TX; scanning & SW. Paging network. *HASMC Newsletter*. Meets Jan & June.

Hudson Valley Monitors Association (HVMA): Patrick Libretti, P.O. Box 706, Highland, NY 12528. Mid-Hudson valley and surrounding counties; VHF/UHF, public safety. *The Hudson Valley Monitor*.

International 11 Meter Alliance: Allen Newton, Rt. 1 Box 187-A, Whitney, TX 76692, (817) 694-4047. Public safety, traffic handling, all bands, esp. 11 meters.

THE NEW HANDHELD PACESETTER IS HERE!

ICOM R-10 Only $499.95

Order SCN 06 and add $9.00
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- *500 kHz-1300 MHz (less cellular)*
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- *On-screen "band scope"*
- *Zero-wait-state scanning*
- *Vastly superior to the R-1 which it replaces!*

Be one of the first to get this marvel of technology, available now from Grove at a truly marvelous price!

This incredible, new scanner is light years ahead of the competition. Features continuous 500 kHz-1300 MHz (less cellular) frequency coverage, multimode (AM/WFM/NFM/SSB) reception, rotary tuning control, programmable tuning steps from 100 Hz-1 MHz, on-screen "band scope" (200 kHz span), 1000 channel non-volatile memory, computer control, and second-radio cloning—and these are just the beginning!

The sleek, compact, lightweight R-10 has large, easy-to-read—and touch—keys. Its revolutionary zero-wait-state scanning seeks and holds in readiness the next active frequency while you are listening to another signal! Wide-dynamic-range, triple conversion, tunable bandpass filters, and sharp selectivity assure dramatic improvement in interference-free reception.

Eight alphanumeric characters can be entered to identify any channel, and ten characters can be used to identify banks. Voice scan control skips unmodulated carriers. Scan memory channels by bank, mode, or program. High-contrast display and powerful, dual-function keyboard provide incredible options to suit your listening requirements. Noise blanker and automatic noise limiter provide double noise reduction. Sleep timer and programmable attenuator are additional advantages.

ACCESSORIES

ACC 74	CT-17 interface	$134.95
ACC 03	OPC-478 computer interface cable	$45.95
ACC 04	OPC-479 Cloning cable (R10 to R10)	$17.95
DCC 05	CP-12 cigarette lighter cable w/noise filter	$29.95
CAS 01	LC-140 Carrying case	$29.95
SFT 01	CS-R10 Cloning software (use with ACC 04)	$29.95
HDP 03	Lightweight Comm. Headphones	$22.95

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ASK BOB

ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, WA4PYQ
bob@grove.net

Q. *As a non-ham I occasionally hear emergency transmissions on the two-meter band, but no replies. How can I help? (Chris Desio, Deer Park, NY)*

A. Unfortunately, you can't—at least not by radio. Although there is no privacy protection to amateur radio transmissions, and you are free to tell anyone what you heard, you must be licensed to transmit. If enough information is transmitted, you can relay the facts to the appropriate police, medical, or fire department.

You might try contacting a local ham club with your question to see if they can provide you with names and phone numbers of repeater licensees whom you can call to see how you can help.

You could, of course, sign up to take the ham classes taught by these clubs and get your No-Code Technician license; then, next time you hear the emergency call, you can help!

Q. *I have two Regency crystal scanners that exhibit a hum on the same frequency when a signal is received, but not on other frequencies, nor is the hum present on another scanner I tried. Any ideas? (Tom Carroll, Lee's Summit, MO)*

A. I don't have a clue, but perhaps if you can answer the following questions, you might come up with one of your own: Are there any residual signals still on the air after your primary signals go off the air? Do you hear the hum even with the set's own attachable antenna as well as with an outside antenna? Do you hear it on one Regency with the other turned off (possible mutually-generated interference)? Is the hum still present when you are powering it from a battery supply rather than AC? Is it present on any other channels besides the one? Have you heard the hum on any other scanner?

Perhaps going through these questions may give you some insight into the cause.

Q. *What is CTCSS and what is it used for? (D. Pradipto, Bogor, Indonesia)*

A. Continuous tone controlled squelch system, sometimes called subaudible tone, or by the proper name Private Line ("PL"), is a means of separating groups of common users who share one frequency so they don't hear distracting communications from the other groups.

Basically, it works like this. The transmitters are equipped to send a low-pitch tone, generally not audible through the speaker, along with the voice. Only receivers equipped with a tone squelch set to the pitch of that tone will allow audio to be heard from the speaker. Thus, several departments may share the same frequency without having to listen to each other; the speaker will open only when their radios detect the sub-audible tone set for their department.

Q. *Last night I overheard a cellular phone call on which two men were planning an armed robbery of a local convenience store. In today's newspaper I was shocked to see the account in which one of the clerks was murdered. I think I can identify*

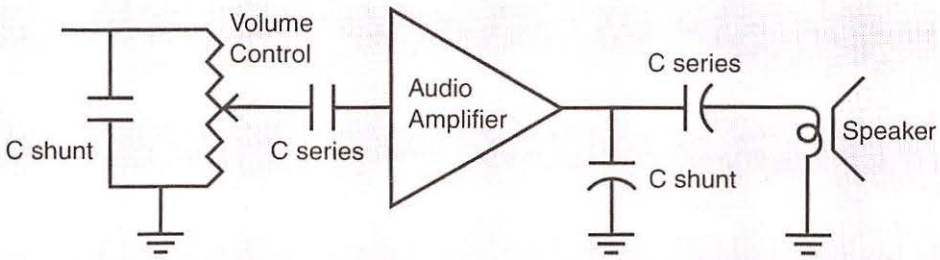
Bob's Tip of the Month

Improving Receiver/scanner Audio

With the high prices we pay for scanners and shortwave receivers, we should expect good speakers, but usually they aren't. With tiny hand-held radios, it's understandable, but with expensive tabletops, it's unforgivable.

Sometimes the speaker can simply be exchanged with one of better quality. Better, the substitution of an external speaker in an enclosure makes an enormous improvement in sound. But just as often it's the original design of the circuitry that limits the quality—inexcusable, because every audio chip made today is capable of high quality sound.

MT reader Bob Thomas of Bridgeport, Connecticut, merely exchanged two audio capacitors in his BC210 scanner to improve the audio; in his case, a 47 and 470 microfarad capacitor were simply switched in placement.



To custom tailor the audio in any circuit, merely change series or shunt capacitor values. For example, in the diagram below, increased capacitance in series (C series) will boost bass, while increased capacitance from audio to ground (C shunt) will reduce treble.

If sound is muffled or "boomy," reduce the series capacitance by 50%-80%. If sound is too harsh or "tinny," increase the shunt capacitances by 100-500%. Experiment with various capacitances for the most comfortable sound. Don't forget that the speaker must be in its enclosed cabinet for the final trial.

one of the perpetrators, but I'm afraid to contact authorities because of the law against monitoring phone calls. What can I do? (Name and location withheld)

A. First, call your attorney, or even a court-appointed attorney, to learn your rights to immunity for giving testimony. Few—if any—prosecutors would press charges against you for turning evidence which could help solve a capital crime. Remember, even if the information overheard cannot be used in court, it can be of invaluable assistance in other evidence gathering.

Do any of your local broadcasters have a "Crime Stoppers" program, offering rewards for information? If so, contact them anonymously from a pay phone for their recommendations. You might even wish to contact a seasoned investigative newspaper reporter for his or her wisdom.

If none of those sounds promising, get back in touch with us and we'll try something else.

Q. I am unable to pick up many of the DX stations listed in the shortwave guide section of MT; how come? (Russ Richards, Bellevue, WA)

A. Several possibilities:

(1) Propagation between Europe and the U.S. West Coast is usually poor;

(2) The stations beam their signals in other directions;

(3) Local interference makes reception difficult or impossible;

(4) Your antenna pattern rejects signals from those directions;

(5) Other co-channel users obliterate your target station;

(6) Your receiver suffers from low sensitivity;

(7) Your receiver selectivity doesn't discriminate between closely-spaced stations;

(8) Your receiver is being desensitized by overly-strong signals;

(9) The loggings or listings you see printed have changed.

Q. Was the Roswell, NM, UFO incident which has had so much publicity, fact or fiction? (Donald Choleva, Euclid, OH)

A. The incident actually happened, but the romanticized accounts in the irresponsibly sensational tabloids, movies, and TV media are pure fiction, written to exploit public trust and gullibility, while capitalizing on revenues.

It has been well established by those working on the project and living in the Roswell area in 1947 that the debris was from an experimental weather balloon, nothing more. Nonetheless, exaggeration and fictionalizing will continue; it's sensational and it's profitable. It's been going on since private pilot Kenneth Arnold in that same year described a probable weather phenomenon over Mount Rainier as looking like "saucers skipping over water," and flying saucers have been with us ever since.

Questions or tips sent to "Ask Bob," c/o *MT* are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of *MT*, or e-mail to **bob@grove.net**. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: **www.grove.net**

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All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word. Commercial line ads printed in bold type.

1-3/4" SQUARE DISPLAY AD: $50 per issue if camera-ready copy or, $85 if copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 704-389-4007.

DX TOOLS for the serious radio listener. Quantum Loops, Q-Sticks, more. Stamp for catalog. Radio Plus+ Electronics, 3635 Chastain Way, Pensacola, FL 32504. (904) 434-3635.

GE SUPERADIO III, custom designed with up to four noise-free SCA channels. Performance guaranteed. Credit Card orders accepted. (800) 944-0630.

FM MICRO BROADCASTING: Transmit many miles. 88-108 MHz. PLL. Kit or assembled. Mono/stereo, 1-100 watts. Call (250) 642-2859. R. Scott Communications.

SPORADIC WAVES! A newsletter that will surprise you ... FREE SAMPLE! All you need to do is ask; Pineapple Paradise Radio Company, P.O. Box 751, Chester, MA 01011.

RC-740X, band expansion for KENWOOD 741/742 series, ScannerWEAR WINDOWS software for ICOM, AOR, Opto receivers. See all at http://www.radioscan.com. Radio Control Systems Inc. (800) 560-7234.

SOUP UP YOUR RADIO with extra-narrow AM and FM filters, internal antenna booster, alignment, modifications, all done in our lab! Send $.32 stamp for details. Worldcom, Box 3364, Ft. Pierce, FL 34948. (407) 466-4640.

POLICE AND FIRE SCANNERS, CB radios, microphones, hard to find electronic items, more! Picture price lists $1.00 (refundable). Over 10 years in business. Galaxy Electronics, Box-1202, Akron, OH 44309

TEST EQUIPMENT BONANZA! Free shipping! Bird 4411W wattmeter, like new; elements for 2-30, 144-520, 400-1000 MHz, leather case. Orig. cost $1383 (order TIN75 $699.95). Tenney Jr. Environmental Test Chamber (order UTST-1 $2000.00). Hewlett Packard DraftPro Excel Plotter MDL#7576A (order UPTR2 $2000.00). Grove Enterprises, P.O. Box 98, Brasstown, NC 28902. 1-800-438-8155.

FOR SALE: ICOM R7100 RECEIVER full coverage (800 MHz) with UT36 voice synthesizer, like new $1195.00 OBO, includes air freight. Call Bob (607) 785-3420 after 4 pm.

PRO-46 HANDHELD scanner, 100 channel, 29-956 MHz, cellular restored. New in the box. $325.00. Call or fax Thomas at (513) 661-1234.

"RADIO STUFF SALE!" Magazines, bulletins, books, radio station items, some equipment. Send 2-stamp business size SASE or $1 for list: G. Dexter, 213 Forest St., Lake Geneva, WI 53147.

FOR SALE: NRD535D, $995. HP410B VTVM, $135. Kiwa M/W Air Loop, $250. Drake SPR4 w/noise blanker, $200. Heath SB310, $200. Shipping included ConUS. Doug (541) 367-6486.

GRUNDIG SATELLIT-700 with four memory chips and manuals. Optional custom switch system for auxiliary speakers/headphones. Optional custom radio/speakers stand. Radio alone $375. With options, $405. Super Value! Best Available! Tom (423) 877-7270.

ICOM R71A w/extras, matching speaker. $900 plus shipping. (512) 993-1454, K5CN.

IC-7100, full coverage, excellent condition. $1,025. Shipped. Bob (203) 630-3552.

ICOM R71A, mint, new lith. batt. 7-93, $1550.00 plus shipping. 2006, real good, $325.00 plus shipping. George (207) 965-8675.

ICOM R7100, unblocked, NIB, $1500.00. ICOM R71A, PBT, like new, $600.00. 150' R-G8 and discone antenna, new, $125.00. Package, $2000.00. (616) 755-5715.

CLEANING SHACK - SASE for list of SW, scanner, utility books, magazines, miscellaneous items. Kevin Hobson, 3227 NE 88th St, Seattle, WA 98115.

LOOKING FOR A FIX-IT CHALLENGE? Martin Theil would like old or outdated CB radios, scanners, or any type of electronic equipment which would otherwise be discarded. He says he is paralyzed but needs activities to keep his hands occupied. Many thanks to those who sent him equipment last year. Send to: Martin Theil, 3521 Atlantis Dr., Holiday, FL 34691.

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Canada Surface*	☐ $19.95*	☐ $36.50*	☐ $69.95*	☐ $103.95*	☐ $28.50*
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1-800-438-8155

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Do you know your four-digit postal zip code extension? If your mailing address uses a route number, have you been assigned a 911 street address, instead? The P.O. has informed us they will begin delaying delivery of mail that does not contain these correct elements. We will not be able to honor replacement requests for a month after non-delivery if your address does not comply.

28902-0098

Look at your label to see if it lacks the required information. If so, please send your updated mailing address to us at P.O. Box 98, Brasstown, NC 28902-0098, or e-mail to order@grove.net. Thanks for helping us get *Monitoring Times* to your doorstep in the most speedy and economical way possible.

CLOSING COMMENTS

By Bob Grove, Publisher

Will Scanner Listening Take an Upturn?

Perhaps the best news scanner listeners have heard in quite a while—and they have had more than their share of bad news—is Uniden's new BC235XLT and B890XLT hand-held and base/mobile trunk-tracking scanners.* Many hobbyists have bemoaned the virtual demise of public safety signals in larger cities across the nation blamed on the big switch to trunking.

Trunking is rampaging across the country, and it's a very effective fleet communications management tool. Instead of one or two seldom-heard departments within an agency monopolizing exclusive frequency assignments, while other high-traffic users compete for their access to the airwaves, all frequencies are pooled and shared on a rotating, as needed, basis. And it works.

Uniden will open up an enormous market with their two new entries being announced at the Consumer Electronics Show, and other brands are sure to follow; it's the *only* way to go. But there is more to the story than just a new product. If Uniden can establish that digitized signal control is for spectrum efficiency and not security or privacy, then how about other forms of digitization?

If, after a period of time, it is established that at least some forms of digitization of radio transmissions are solely for spectrum efficiency, then a case could be made that the prohibitions of the 1986 Electronic Communications Privacy Act (ECPA '86) against decoding digitized communications do not apply to all forms of digitization, making digital-decoding scanners legal. Perhaps public ciphers and standard algorithms will be re-interpreted in the computer-age perspective of bandwidth efficiency, not privacy.

Even the specter of APCO 25 and its attempt to standardize all public safety communications into several tiers of security, could have a moderating influence on scrambling, with many agencies intercommunicating in the least cumbersome, clear speech mode. This assumes, of course, that APCO 25 itself becomes universally accepted—a process that could take years.

This is speculative at best, but let's take a look at another pall that hung over the hobby recently. It was quite clear that after early 1994 the importation and marketing of cellular-capable and cellular-restorable scanners was unlawful, but after-market modifications abound for many current models, and the FCC seems to be content, facing much more daunting tasks than prosecuting scanner vendors and recreational hobbyists. The cellular industry which pushed for the legislation seems to have abandoned the effort as well, going after, instead, profit-robbing cellular telephone cloners.

The next few months will be prophetic. The slowdown in scanner sales seems to have tapered off; sales may not be as vigorous as vendors would like, but they have stabilized. Profit margins, however, remain dismal. Many cut-throat speculators advertise on a shoestring, then wait until they have enough orders to call a distributor to qualify for merchandise. When it finally arrives, it is reshipped to irritated customers who thought the discounters had the item in stock.

Demand for the new-generation, trunk-tracking scanners is expected to be heavy. Will the success be fleeting, or will a renewed, upward spiral of enthusiasm for monitoring be generated by these cutting-edge products? Time will tell.

See page 30 for initial details from Scanning Report columnist Rich Barnett, and watch for his article on how these receivers work in next month's feature section.

Thank You

On a personal note, now that the holidays are behind us for another year, I would like to thank so many of you who shared the kindness of the season by sending cards and email greetings. Even though the perception by most is that we are just another company, Grove Enterprises is staffed, happily, by caring individuals who are deeply touched by thoughtful gestures. We truly hope that all of you benefit from health, success, and happiness in the coming year.

Catch MORE Listening Excitement!

PC Programmable for Total Scanning Control!*

Using a PC and available third party FCC Master File licensee database info (on CD-ROM or HD Disks), quickly customize your IC-R10 to scan only the active channels you want—anywhere in the country! ICOM's CI-V computer interface is built right in! You can also quickly clone data from PC to IC-R10, or from one IC-R10 to another.

PC Ready!

Advanced Operation in an Easy to Use Package!

- Beginning listeners can start out using the IC-R10's ***easy mode:*** select 1 of 10 band scan programs set by ICOM's factory. As your listening preferences grow, the scans can be changed to follow the listener's desired settings!

Actual Size!
2.3"(w) x 5.1"(h) x 1.2" (d)

Uses Ni-Cd, Alkaline or other DC Power**

The IC-R10 comes with a battery pack that uses either "AA" alkalines or the ***included "AA" Ni-Cd batteries****. For frequent listeners, use the right-in-the-radio rechargeable Ni-Cds (AC wall charger plug also included). Infrequent listeners may prefer using alkalines for their long power storage capacity. Or use an external DC power source, like a car cigarette lighter!*

Next Generation Features for the Serious Listener!

- ***7 different scan types*** with ***priority watch*** include the all ***new "signal navigation" (SIG NAVI) scan.*** While you listen to a paused frequency, the SIG NAVI scan looks for the next busy frequency (within ± 100 kHz)!
- ***Tunable bandpass filters*** provide excellent image reception and help reduce intermod.
- A ***built-in 20 db attenuator*** helps block unwanted noise.

- A ***"real-time" band scope*** makes it easy to find busy frequencies and to note band conditions. *A handheld first!*
- The ***alphanumeric dot matrix display*** allows up to 8 characters per channel name and up to 10 characters per bank name.
- Large ***36mm† speaker*** for loud, crisp audio.
- ***1000 memory channels*** with an EEPROM. Memories are arranged in ***18 banks of 50 channels***, with 100 channels for auto memory write and program skip scan.
- Noise blanker, lock, sleep timer, auto frequency control (AFC), & more!

Impressive Specifications!

- ***Wide band performance!***
  500 kHz – 1.3 GHz coverage††
- ***All Modes, including SSB for SWL's***
  AM, FM, WFM, USB, LSB, CW

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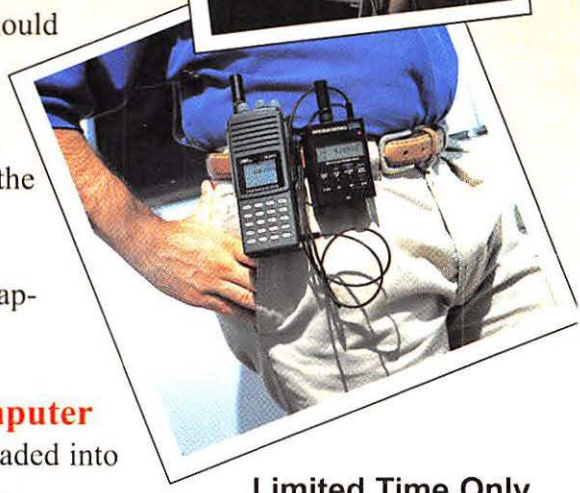
You're driving down the road and you see 2-way communications taking place. **Now What?** Using your scanner you would have to take an educated guess as to what frequency to start scanning, and chances are you would never be able to capture the signal in time. **Problem Solved.** With the Scout just turn it on and frequencies from 10MHz-1.4GHz are captured in less than ten milliseconds, and record up to 400 frequencies in memory. Recorded frequencies are not duplicated, as the Scout will keep track of the number of hits per frequency.



Why Do I Need A Scout?

An intelligent question that every scanner owner should ask themselves. At the Races, a Sporting Event, Air Show, Ham Fest, Crime Scene, Etc. The Scout will capture unknown signals off the air so you can manually program them into your scanner. Or, use the Reaction Tune® function. The Scout automatically tunes your AR8000/AR2700 or ICOM R7000/7100/9000 to the frequency it captures in less than ten milliseconds.

U.S. Patent No. 5,471,402

Store Frequencies In Your Computer

All the Scout memories can be downloaded into your PC using the optional Optoelectronics OptoLinx and checked against the Spectrum FCC database. Now you can keep track of all the activity along your scanning journey.

With The Scout Frequency Recorder, Nothing Transmits Unknown.

Limited Time Only

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